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The Journal of the American Medical Association

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THE TREATMENT OF URETHRAL STRICTURE BY EXCISION *

GRANVILLE MACGOWAN, M.D.
LOS ANGELES

The important subject of the treatment of urethral stricture by excision is given very scant attention in the textbooks of general surgery, and not much more by the authors writing on the specialty of urology.

Resection of strictures as a surgical procedure for effecting a relative cure of permanent duration has never gained great popularity with the surgical world, chiefly because of lack of accurate knowledge of the anatomy of the urethra and the perineum, and of the ever present fear that the removal of any portion of the corpus spongiosum will result in lasting multilation, with prevention of erection, and impotence. There has also been a natural apprehension that after the removal of sections of the canal of considerable extent, there might result a necrosis of the approximated cut ends. For these reasons, reports of resections have usually been confined to the results obtained from the removal of the two sides and the bottom of the tube, and the nodules infiltrating the spongy body and the adjacent tissues, leaving a strip of mucosa, frequently a very narrow one, from which the epithelial lining of the new tube is to be proliferated. A better understanding of the remarkable distribution of the blood supply to the urethra lavishly furnished from the bulbous, cavernous and dorsal branches from the internal pudic arteries, by anterior as well as posterior anastomosis, a knowledge that the tube can be mobilized to almost its entire extent without risk of necrosis, and an acquaintance with the muscles attached to the scroto-perineal portion of the urethra, makes urethrectomy in certain types of stricture a procedure of choice, which I am ready to advocate and demonstrate in this paper.

The trail of the history of this operation, like that of so many of the procedures of modern surgery on pelvic and perineal organs, leads directly to the amphitheater of an American teacher, Dugas,[1] who first reported a case of complete resection of the urethra without any attempt to bring the cut ends together. From time to time in France, Germany, England, Switzerland and America, during the last hundred years, occasionally a report of partial or complete urethrectomy, usually partial, has appeared in the professional journals, but without creating any stir or widespread emulation.

The first surgeon to practice sutures of the separated ends was Heusner, in 1882; but much more ingenuity has been shown in the repeated efforts to supply a mucosa for the tube between these ends by grafts from the skin of the perineum, scrotum or prepuce, a pedicle flap of Dartos, fascial grafts, Thiersch grafts supplied from the mucosa of a prolapsed uterus, transplanted bodily, or the insertion of tubular grafts derived from large veins of other mammals, or of the appendical tube sutured in place over a catheter. With any one or all of these, at times, results more or less successful are obtained, temporarily satisfactory, at least to the surgeons using them. During the last century, the only surgeon who adopted urethrectomy as a method of choice in the treatment of severe strictures of the urethra was Koenig, in whose clinic the rule was, for a time at least, to submit all such cases to resection when the mucosa of the urethra had lost its characteristics as a mucous membrane, and the resected ends of the tube could be brought together. He reported some very interesting results, but apparently failed to realize the advantages afforded in the operation by the extreme mobility of the urethra. Resection has been also extensively practiced at the Necker Hospital by Guyon and his followers, Albarran, Legueu and Marion, but confined to cases that permit the retention of a continuous mucosa, and it is applicable only to cases not requiring the loss of more than from 2.5 to 3 cm. on the sides and floor of the canal. A very satisfactory technic was worked out by this school for the repair of such a partial resection.[2] A second operation devised for the same purpose and applicable only to very narrow and incomplete strictures at the junction of the membranous and bulbar portions of the canal is that of Stern.[3] Ingenious in its conception and surgical in its execution, it is meant to deal with cases in which there is no cicatricial destruction of the corpus spongiosum.

For the radical removal of all of the stricture from face to face, anteroposteriorly, together with the entire spongy body within these limits, use may be made of (1) the Albarran technic; (2) the technic of Hamilton Russell of Melbourne, and (3) the technic which I developed during my years of active service in the Los Angeles County Hospital, and have since applied, from time to time, in my private practice, with most gratifying results.

In any of these operations, whether the incomplete resections of the Necker school or of Sterns, or the radical procedures of Albarran, of Russell or that which I have adopted, a satisfactory field for the operation is to be obtained only by having the patient in an exaggerated lithotomy position, using an inverted Y-shaped incision for the obtaining of a complete

* Read before the Section on Urology at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

1. Dugas: South. M. J., 1836.

2. Greene and Brooks: Diseases of the Genito-Urinary Organs and Kidneys, Ed. 3, Philadelphia, W. B. Saunders Company, 1902, pp. 452-453.

3. Stern, Maximilian: Plastic Operation for the Cure of Urethral Stricture, J. A. M. A. 74:85 (Jan. 10) 1920.

exposure of the musculature of the perineum and the scrotoperineal urethra, so that the entire structure of the corpus spongiosum, from the urogenital diaphragm to a point as far forward in the phallic urethra as may be found necessary, is laid bare, and so separated from its attached structures that the diseased and strictured portion may be freely removed in its entirety, and the parts of the tube beyond these limits mobilized so completely that they may be united by suture without tension. In the presence of a case deemed suitable for this radical procedure, a preceding suprapubic drainage should be instituted and maintained for a time sufficient to demonstrate whether, as so often happens, the infiltration in the tissues about the urethra, relieved of the continuous irritating influence of the decomposed urine, may not gradually soften and disappear to the extent that the stricture deemed impassable readily becomes easily amenable to dilation. If, after about two weeks, this change does not take place, resection of the stricture becomes the procedure of choice.

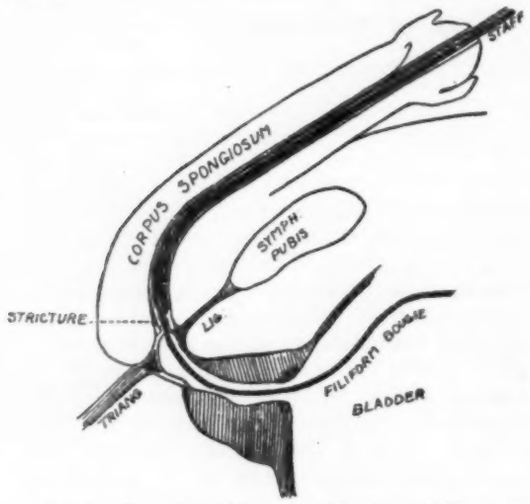

Fig. 1.—Common position of strictures requiring resection (schematic; reproduced from Maxmilian Stern).

Fig. 2.—Resection of the urethra—Albarran method (reproduced from Green and Brooks: Diseases of the Genito-Urinary Organs and Kidneys).

Preparation for the exposure of the stricture should include a number of delicate sharp knives, both for incision and dissection, small sharp scissors, straight and curved, delicate needles, sharp and round pointed, which will hold No. 0 chromicized catgut, fine pure silver lacrimal probes, and a dozen fine straight and curved artery forceps—in fact, the instruments necessary are those which should be found in the kit of an eye surgeon. In addition, one requires a fine grooved director, a small straight gorget, a Wheelhouse staff, to cut on for opening the urethra anterior to the stricture if no filiform can be passed as a guide, and a Gouley tunneled staff of silver, No. 8 or 10, if a filiform can be made to penetrate the stricture, a retrograde staff on which to open the urethra behind the stricture and the usual bifid and other retractors necessary in exposing the apex of the prostate, as in Young's perineal prostatectomy.

I know of nothing in surgery that is quite so disgusting as to see an operator messing at a stricture with unsuitable and inadequate tools, destroying, by clownish gestures, whatever favorable chances the subject may have of recovery from his terrible disease. If no filiform or guide may be made to penetrate the stricture, its remaining mucous channel may be mapped out by staining its course with the solution of a dye, injected under pressure through the urethra. For more than thirty years, in the Los Angeles County Hospital, I have used methylene blue for this purpose, for which I claim no priority, as I think I received the idea from my teacher, Prof. Robert Ultzmann, in Vienna.

The preliminary dissection finished, the central tendon of the perineum severed close to the bulb, and the anterior layer of the triangular ligament well exposed, the ischiocavernous muscles should be pushed aside, and the bulbocavernous tendon split along the white line at its center to the point at which it joins the insertion of the tendons of the superficial transverse perineal muscles at the root of the bulb. These are to be clamped and severed close to their insertion into the spongy body, exposing the urethra, which is then easily freed from its fascial and muscular coverings and its attachments to the cavernous bodies, chiefly by blunt dissection with gauze, straight scissors and knife handle, as far forward and backward as required to get past the limits of obstruction and expose healthy mucosa in opening the canal. These steps should be conducted with patience and gentleness, for it is essential to do no gross damage to the arterial or nerve supply.

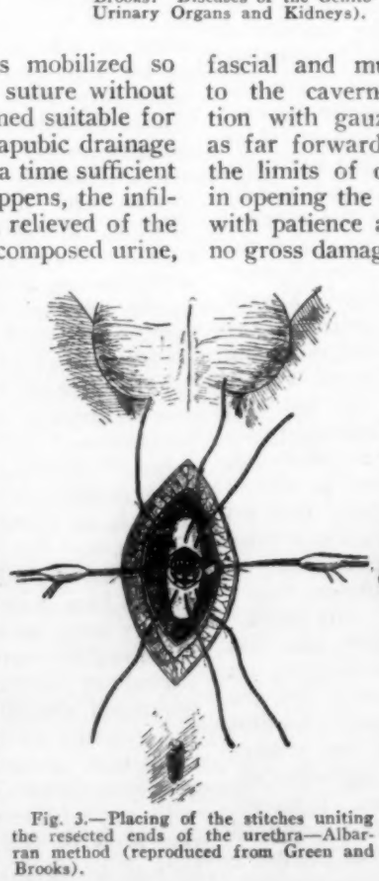

Fig. 3.—Placing of the stitches uniting the resected ends of the urethra—Albarran method (reproduced from Green and Brooks).

Fig. 4.—Exposure of central tendon of the perineum (reproduced from Hamilton Russell, Brit. J. Surg., 1914-1915).

If a filiform guide can be passed, the urethra can be opened in the strictured portion on the Gouley catheter staff which has been threaded on it, and its course followed anteriorly and posteriorly until healthy elastic mucosa is encountered. If no guide can be introduced, a small quantity of a solution of methylene

blue may be injected down the canal under moderate pressure and the canal opened directly in front of the palpable limits of the stricture on a Wheelhouse staff, when, after the introduction of two traction sutures, through the entire urethral walls on each side, including the mucosa, by the aid of a good light, the sclerosed and contracted canal may be searched for by fine silver probes, gently and patiently, following the stained epithelium, and with sharp, fine knives and scissors gradually laid bare to its posterior limits.

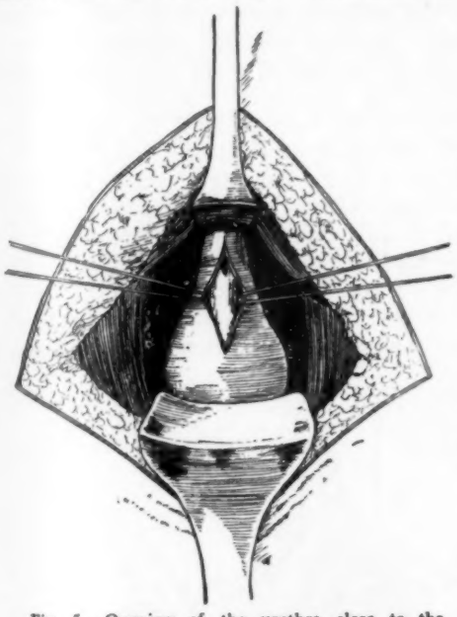

Fig. 5.—Opening of the urethra close to the stricture (reproduced from Hamilton Russell).

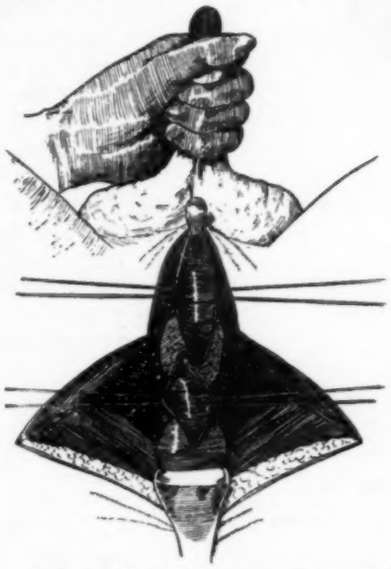

Fig. 6.—Urethral tissues to be resected (reproduced from Hamilton Russell).

If the track of the stricture is lost or appears to be totally obliterated, the urethra is to be opened on a retrograde staff in front of the anterior layer of the triangular ligament and as close to the stricture as possible, the traction sutures inserted in the urethral walls and the search for the canal conducted forward with the silver probe, filiforms or silk bougies. When it is found and laid open from one extremity to the other, the operator is then ready to resect, whether the procedure adopted is that of Albarran, applicable only to contractures in the tube not exceeding 2.5 cm. in length, that of Russell or that which I have described, in which the only limit is that in which the two ends may be brought together by sutures without excessive tension, and which has actually in experience amounted to as much as 8 or 9 cm. The line for excision must be made in healthy mucosa and beyond the sclerosed infiltration of the spongy body in which the urethra lies; thus severed, fore and aft, the sclerosed canal, with its portion of the spongy body and the surrounding nodular tissue, is to be dissected out from its bed in its entirety, avoiding injury to the corpora cavernosa and to the internal pudic artery and its larger branches. Ordinarily, the hemorrhage will be only moderate, for the inflammatory changes, long continued, have so cicatrized the reticulated normal structure of the bulb that its spongy nature is lost. In removing the fleshy flap from beneath the arch of the pubes, one should bear in mind the close proximity of the plexus of Santorini.

The section of the tube removed, the appearance of the structures in the perineal field is not encouraging; but because of the great elasticity of the urethra, its great mobility and its rich blood supply, marvels can be accomplished in its repair, by either the Russell procedure or mine. In the operation of Russell, in which the primary incisions into the healthy canal have been made, both anteriorly and posteriorly a considerable distance from the face of the stricture, after the excision, a flat strip of mucous membrane is left in the field, which he proceeds to extend and enlarge by slitting the canal farther on its ventral surface and then undercutting both strips of the ribband until enough is mobilized so that the two squarely cut ends can be sewed together without tension by five catgut sutures passed so that the knots are tied on the mucosa. The surface of the wound is protected from urinary contact by means of a catheter inserted through the

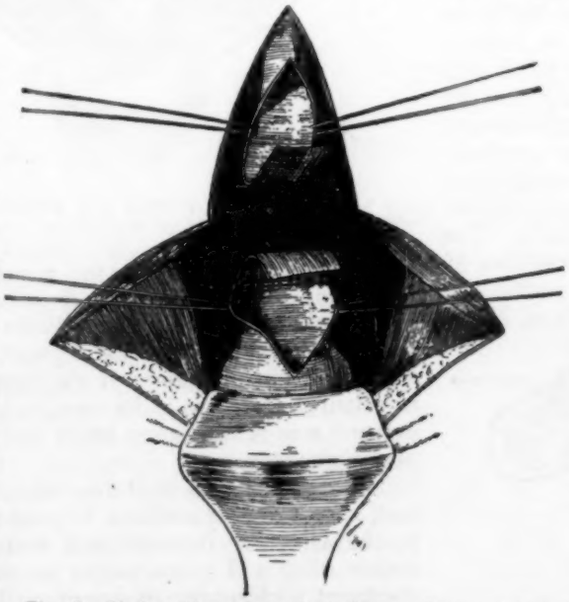

Fig. 7.—Undercutting of urethral tissues after resection (reproduced from Hamilton Russell).

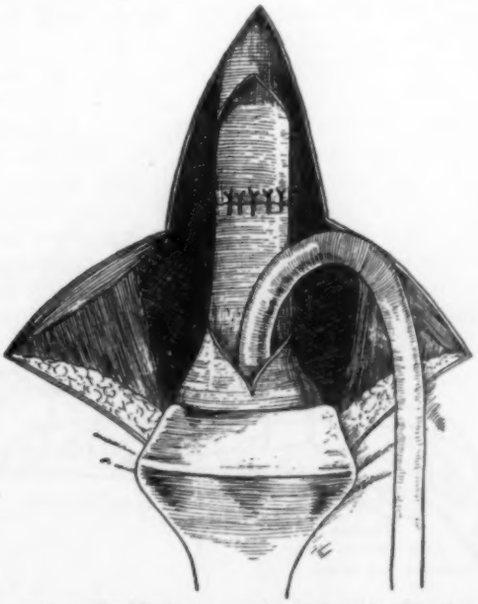

Fig. 8.—Uniting of the undercut urethral tissues by five sutures, and placing of a rubber drain in the proximal portion of the urethra (reproduced from Hamilton Russell).

membranous urethra at the apex of the prostate, and the reconstruction of the canal is left to itself, depending on the fact that on account of the peculiar structure of the perineum, the sides of the urethra will roll in and it will eventually resume its normal tubular form,

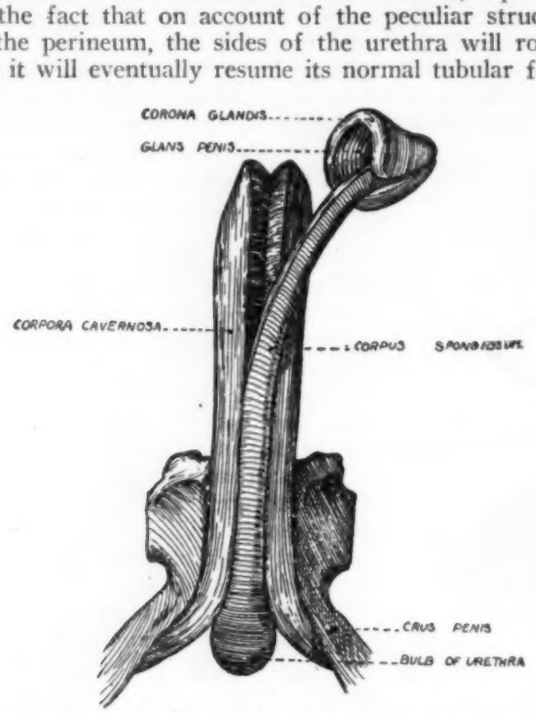

Fig. 9.—Ease with which the corpus spongiosum separates from the corpora cavernosa; mobility of the corpus spongiosum (reproduced from Gray's Anatomy).

if a continuous mucosa is secured on its dorsal aspect, and contamination or infection by urine is not permitted during the first few days following operation.

In my operation, the intention is to restore the tube by approximating its cut ends in their entire circumference, and I find that this is best achieved not by the laying of a circular stitch, such as was done by Mayo Robson with success after the excision of an annular stricture where the loss of structure was not more than ¼ inch, and as was the practice of König, but by slitting the urethra and spongy body both anteriorly and posteriorly into three strips, or ribbands, one posterior and two lateral, using great care not to mangle the tissues and to have clean incisions; for this purpose, one must have very sharp, straight eye scissors. The length of these ribbands will vary with the necessities of the case, but they must be long enough to permit the placing, in the posterior one, of three sutures of No. 0

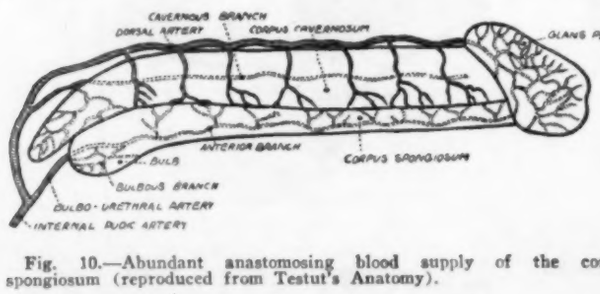

Fig. 10.—Abundant anastomosing blood supply of the corpus spongiosum (reproduced from Testut's Anatomy).

chromicized catgut, which has been soaked in hot salt solution previously to render it flexible, and each threaded on two fine, sharp needles and inserted about 1 cm. from the cut edge of the tube, passed from within, out, and tied with the knots outside the lumen of the canal, the central first. Before the knots are tied, the cut edges are to be approximated by means of traction sutures of silk inserted in the mobilized ends of the urethral body just beyond those parts which have been converted into the ribbands. If they do not join easily under moderate traction, the tube may be mobilized still further, if necessary, the skin slit being extended as far as the frenum, and the spongy body pried out of its bed, where it lies mortised between the corpora cavernosa, and the posterior segment of the tube may be loosened by careful blunt dissection, after the attachments of the superficial transverse perineal muscles to the bulb have been severed, as far as the anterior layer of the triangular ligament.

When it is found that the cut edges can be brought together by moderate traction, both sections of the tube are then anchored in this position to the bed from which the cicatrized urethral tissues have been removed, by means of sutures of No. 0 chromicized catgut, previously softened, using new, round-pointed needles of appropriate size. These stay sutures must be inserted

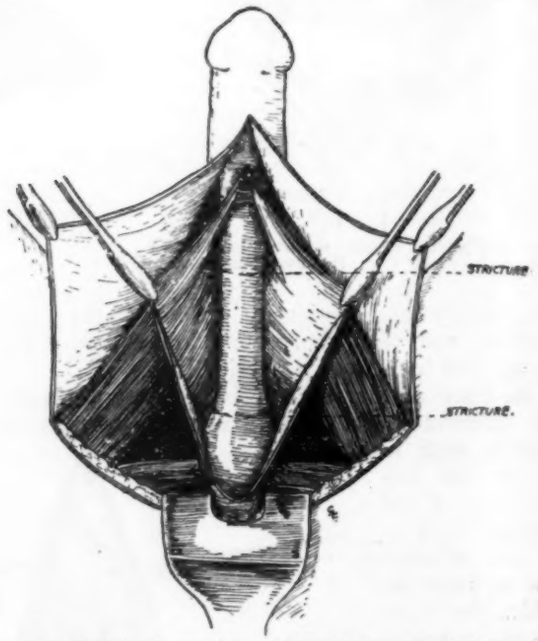

Fig. 11.—Method of exposing and mobilizing the stricture tissues before resection.

into firm tissues; they always penetrate the sheath of the spongy body and may, if necessary, be inserted into, but not through, the sheaths of the cavernous bodies. As many of these sutures may be employed as may, in the judgment of the operator, be necessary to retain the urethra in its new position and effectively prevent any strain being made on the line of suture of the ribbands.

The three sutures in the dorsal ribband having been tied, a soft rubber catheter is passed from the meatus to the triagular ligament and secured there by one suture of No. 1 plain catgut so that it may not be displaced accidentally or intentionally before the fifth or sixth day, and then the lateral ribbands are sewed together in a like manner, first from end to end with No. 00 chromicized, and then united from side to side by one or more fine sutures of plain gut, after which the disturbed and separated bulbo-urethra muscles are replaced, the cut ends of the transverse perineal muscles repaired and the ischiocavernous muscles which have been retracted, brought forward and attached, by a

few plain catgut sutures to the bulbocavernous muscle mass, to cover better the deep perineal nerves and arteries and the base of the cavernous bodies.

The cellular tissues lying between the skin and the muscle mass of the urethra are repaired and brought together by a few plain catgut sutures so as to obliterate all dead spaces. The skin is repaired with black silk or fine flexible silkworm sutures, but no attempt is to be made to close completely the perineal wound unless the surgeon desires to lose his time and jeopardize the welfare of his patient. The foes that may prevent success are hematoma and infection; neither will occur if a cigaret drain is kept in contact with the surface of the point of excision for a few days, and there need be no hurry about removing it, for oozing serum, liquefying catgut, and staphylococci in a perineal wound make a bad combination, especially in the presence of accidental soiling by infected urine, if drainage is

Fig. 12.—Preparation of the flaps of the urethra and the placing of the stitches in the flaps so as to bring the knots on the outside of the new urethra.

interfered with. So important is this, that I am convinced that the interests of the patient would be better conserved if the entire perineal wound were left open and packed than if an attempt were made to close it without drainage.

Before the ends of the canal are united, the membranous and prostatic urethra should be carefully examined for stenosis. If a stricture is found in the membranous urethra, it should be severed by a Blizzard knife. If contracture of the bladder neck exists, it should be dealt with by the MacGowan-Parker punch. When the excised section of the tube has been very long, when united, it will be noticed that there may be considerable ventral curvature of the penis. This need cause no anxiety; time will restore it to its natural shape. I have always kept the cetheter retained in place in the canal for from six to ten days (this precaution is not taken to assist the uniting of the ends of the ribbands, but to prevent the accidental adhesion of the granulations in the line of union that may not be perfectly covered with the mucosa). Perhaps the wounded surfaces would unite and a tube be formed just as well without it, but my ultimate results have been exceptionally good, and I desire to take no chances.

There is often considerable oozing from the wound for the first twenty-four hours; hence I prefer to use large dressings of plain gauze, moistened with physiologic sodium chloroid or Thiersch solution applied

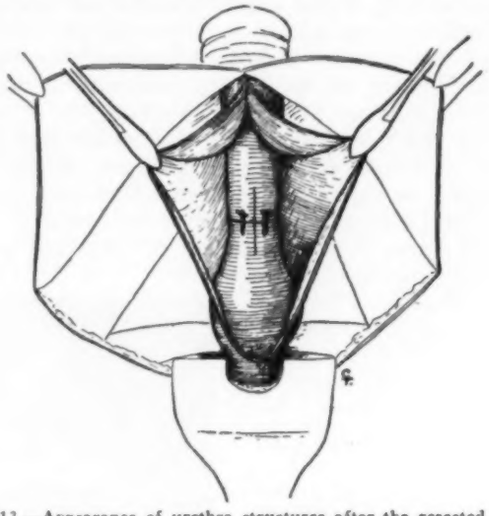

Fig. 13.—Appearance of urethra structures after the resected ends are brought together.

hot and changed frequently and kept against the perineal wound surface under pressure; subsequently, I prefer that the dressings next the skin be plain gauze dipped in melted petrolatum, which so fills the meshes that the dressings will not adhere. The urethral surfaces may unite perfectly and the wound close in two weeks, but this is not to be expected. At the end of the second week, the suprapubic de Pezzer drain is dispensed with; then, usually, the suprapubic wound closes in a few days and normal urination is established. If a fistula persists in the perineum, after the third week, it is probably due to the irritation of an unliquefied and unabsorbed piece of the chromicized gut, and

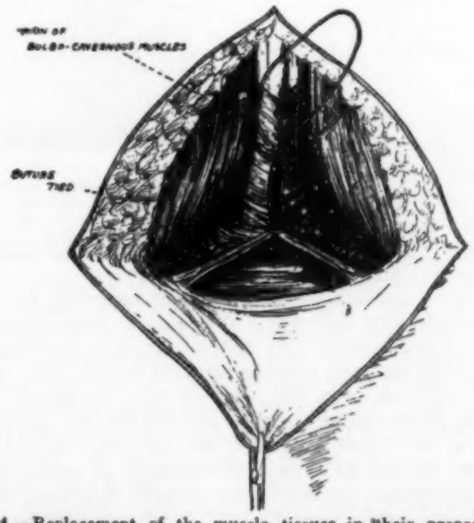

Fig. 14.—Replacement of the muscle tissues in their proper position before the closure of the perineal wound (reproduced from Maxmilian Stern).

one must wait until the knot is loosened and comes away of itself. A sound, not a large one, say 18 or 20 F., may be cautiously passed on the fourteenth day, and then at intervals of a week in gradually increasing caliber, but no attempt should be made to enter sounds

that put the canal on a stretch or distend it; the idea is to secure a canal that will be permanent and allow the patient to pass urine easily, and the use of any violence to the line of sutures may easily produce a rupture of the urethral tissues and defeat the project. If sounds do not pass easily, but the patient voids a full, comfortable stream, the operator should not worry—the canal probably has a kink in a part of the line of healing, and the channel is not continuously straight. The patient should be let alone. So far as he is concerned, the cure is a satisfactory one.

It is very hard to get perfect follow-up histories on difficult stricture cases from patients, especially those operated on in public institutions; relieved and elated, they hide out, and receive no treatment until the stream again becomes slow or small, or retention takes place. Many of these on whom I have performed urethral resections disappeared entirely within a few weeks or a few months, but there were no positive failures. One of my earliest patients, operated on about twenty-five years ago, after an interval of approximately twenty years, reported that he had never had any more trouble after I "cut his strictures out." I have now several under observation who have been operated on in recent years. I had the opportunity of examining one patient's canal with the cysto-urethroscope and through the urethroscopic tube, after the perfect healing of the wound, whose history is given here. This man's report, coming three years after a complete resection of more than 6 cm. of the bulbar urethra, states that he is sexually potent, and "just fine."

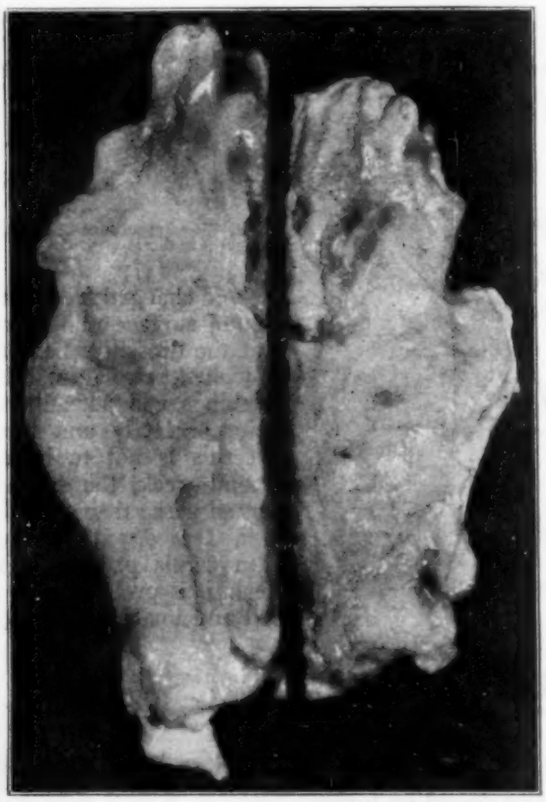

Fig. 15.—Resected portion of a urethra, 8 cm. in length, in which a satisfactory union and a patent urethra were obtained. The dark object in the center of the field is a piece of ordinary green wrapping twine, which quite fills the lumen of the sclerosed urethra.

REPORT OF CASE

I. G., a man, aged 43, a carpenter, a resident of Pine Knot, Calif., referred to me by Dr. Howard Hill of Redlands, Dec. 31, 1919, fell astride a floor beam at the camp where he was working, October 13, and ruptured the urethra. The ends were found by Dr. Hill, and with considerable difficulty a No. 15 soft rubber catheter was passed from the meatus to the bladder, the wound in the urethra repaired, and the external incision closed with drainage. After thirteen days, the catheter was removed; when urinating, the patient passed a good stream, but no instrument larger than a No. 10 F. could be inserted into the bladder. November 19, he had an attack of retention of urine; under incomplete anesthesia, sounds were passed, following which he voided freely until November 27, when he had retention again, which relaxed under heat and morphin. From then until he came to me, December 31, he passed urine in a thin, small stream, without pain.

A hard infiltration was felt at the site of the rupture in the urethra; the prostate was smooth and normal in size. Under local anesthesia, I passed a filiform, and over this, threaded a No. 8 silver Gouley staff catheter, through which the bladder was emptied and the filiform tied in. By continuous dilation with filiforms and silk bougies until Jan. 8, 1920, we secured a canal that would admit the passage of a No. 18 cystoscope. An examination of the bladder showed edema and congestion of the trigon, the usual small hemorrhagic spots from the presence of the bougies, some very fine gravel, and a marked trabeculation of the mucosa which did not disappear on distention. The mucosa of the posterior urethra was abraded and edematous. Examination of the anterior urethra with a No. 22 Koch urethroscope demonstrated a circular stricture of the perineal urethra with no normal mucous membrane about it. The patient was informed that resection of the urethra was necessary; and, having given his consent thereto, a preliminary suprapubic cystotomy was done, January 10.

January 13, we resected a little more than 5 cm. of the bulbar urethra, removing it in its entirety, floor, roof and sides, as well as dissecting out all of the surrounding scar tissue that had resulted from the rupture of October 13. In the removal of the stricture and the restoration of the canal, we used my own method, which is the subject of this report.

January 27, the suprapubic de Pezzer drain was found to be sanded; it was removed and replaced by a new one, which was retained until February 4.

January 29, I passed a No. 19 F. steel sound with ease and followed it with a No. 18 soft rubber catheter so as to irrigate the bladder and the urinary tract from below.

March 1, I found a small abscess in the tissues of the perineum that did not communicate with the urethra; this was drained and gave us no further trouble.

February 5, he was passing one third of the urine by the meatus.

February 20, all of the urine came by way of the meatus.

February 20, the wound of the skin was treated and a No. 27 F. steel sound passed without any obstruction. He was kept under observation until April 1. At that time a No. 28 F. steel sound entered the bladder by its own weight; the patient passed a full and copious stream without any dribbling at the finish, at normal intervals. By the cysto-urethroscope and the open urethroscope we could detect no definite scar tissue. The patient was dismissed.

I have heard from this man twice since, first in March, 1921, without my solicitation; then April 26, 1923, in reply to a follow-up letter. Both letters show that total resection of the bulboperineal spongy body for stricture is feasible without danger of loss of sexual potency and with the result of a permanent cure of the strictures.

ABSTRACT OF DISCUSSION

DR. ROBERT V. DAY, Los Angeles: I have followed up three or four of the patients Dr. MacGowan operated on, and I was amazed at the results. They were just as he has stated this morning.

Health Education and Community Uplift.—If I had the problem of elevating the general moral and mental tone of a backward community I would seek the services of the public health worker, the sanitarian and the personal physician even before those of the teacher. Health education must go forward hand in hand with that of the mind.—Ray Lyman Wilbur, Stanford University, Calif.: *School and Society.*

PREMATURE PRESBYOPIA*

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In all the cases in this series, the eyes were refracted with a mydriatic. Later a postmydriatic examination was made; the majority of the patients had the extraocular muscles tested, and all had an ophthalmoscopic examination of the fundus. Seventeen had also the near point of accommodation and convergence, depth perception, ocular fields and color vision taken separately with each eye. The conclusions reached were that:

1. Many conditions of the eye cause uncorrectable poorness of near vision besides refractive errors.
2. There is a relation between hyperopia and premature presbyopia.
3. Other conditions besides refractive errors occur in premature presbyopia. The contracted fields, as a rule, were associated with general infections, such as tuberculosis and syphilis, and focal infections, as tonsillitis. Color blindness occurred in one or both eyes.
4. Many had muscular weakness. Exophoria was associated with good depth perception. Esophoria and orthophoria in cases of high latent hyperopia occurred with poor depth perception.
5. General infections, focal infections, and cardiorenal, neuropsychiatric and endonasal abnormalities were found.

Presbyopia is that condition of the eyes in which there is a lowered amount of accommodation, necessitating the addition of plus lenses to the distance correction for near use. The condition is usually accompanied by increased near point of accommodation and convergence. It usually occurs at the age of 45 or later. The cases referred to as premature occur in persons ranging in age from 25 to 40, averaging 31½ years. Presbyopia may occur in one or both eyes. When occurring in one eye, the near vision correction sometimes cannot be worn in comfort. Sixty per cent. of the patients required two pairs of glasses; 17 per cent. used bifocals; 17 per cent. used the near vision correction only; 6 per cent. with monocular presbyopia used the distance correction only. There is a weakness of accommodation, usually in persons with hyperopia having a near vision of Jaeger 4 to 8, occasionally as high as Jaeger 10 in one eye; but in these cases the correction for distance is sufficient to give Jaeger 1 or 2.

Conditions among my patients which have caused a poorness of near vision which could not be corrected were: amblyopia from simple optic atrophy, syphilitic papilledema, macular retinochoroiditis, central scotoma associated with sinusitis, detached retina, optic atrophy secondary to cerebral concussion, rupture of the globe from indirect violence, and syphilitic paralysis of accommodation.

The majority of these patients had hyperopia; thirteen had less than plus 2 sphere or cylinder; seven had above plus 2 sphere or cylinder; seven had myopia ranging from minus 50 sphere or cylinder to a minus 4 cylinder; one had myopia in one eye with hyperopia in the other; another had hyperopia in one eye with mixed astigmatism in the other.

In Case 1 there were recurrent attacks of parenchymatous keratitis in the right eye causing a large opacity in the center of the cornea. In the left eye there had been iridocyclitis, causing an iridodialysis; also there was retinochoroiditis. The patient was recommended for blind training. An optical iridectomy was done on the right eye, which gave the patient sufficient vision to undertake training as an automombile mechanic. In Case 10 there was a chronic dacryocystitis in the left eye, which cleared up after rapid dilation of the tear-duct (by Dr. S. Lewis Ziegler's method). Later a pterygium on the same side was buried. In Case 16 the patient had tonsillitis while overseas, and had no medical attention for two weeks. He said that he almost lost his vision, but that it improved 50 per cent. after the removal of the tonsils. Fundus examination showed a large cherry-red spot in the macular region of each eye. He also had a contracted field of vision in both eyes. There were three cases with contracted ocular fields associated with pulmonary tuberculosis. One patient had arrested retinochoroiditis. Two of these patients had both eyes affected; one had this condition in the right eye alone. There were two cases of syphilis with contracted fields, one of which improved under treatment. The other patient who had an Argyll Robertson pupillary reaction in both eyes, did not improve. There was another patient with contracted fields who had a negative Wassermann reaction of the spinal fluid, but which did not entirely disprove syphilis. There was one other arrested case of iridocyclitis. There were two cases of color blindness in both eyes (eyes examined separately), and one case in which there was good color vision in the left eye and poor in the right eye.

There were ten cases of exophoria ranging from 1 to 4 degrees, three of esophoria from 1 to 3.5 degrees, and eleven cases of orthophoria; one patient with marked internal squint could not be tested, and another did not have sufficient intelligence. Three were not examined for muscles. There were four cases of hyperphoria. There were two cases of divergent squint associated with exophoria, and one case of internal alternating squint with esophoria. Seven patients with exophoria were examined for depth perception; six had less than 2 cm.; the seventh had 4.23 cm. but had optic atrophy in both eyes, due to pulmonary tuberculosis. Those who had internal alternating squint had no depth of perception; all positions seemed the same. In exophoria or orthophoria with high latent hyperopia there was poor depth perception.

In this series there were five patients with pulmonary tuberculosis, and two with chronic myocarditis; one died of acute dilatation of the heart; there were one case of chronic interstitial nephritis, two of syphilis, four of neurasthenia, and one of hysteria. With endonasal conditions, five patients had a deflected septum; two had submucous resections done with no improvement to the presbyopia; one had empyema of the antrum of Highmore. The majority of these patients—twenty of the twenty-nine—were ex-service men examined by the United States Veterans' Bureau. The premature aging of the eyes occurred secondary to wounds, illness and strain incidental to the service in the last war.

SUMMARY

There is a relationship between hyperopia and premature presbyopia; occurrence of uncorrectable poor near vision; contracted ocular fields associated with general and focal infections; monocular and binocular color

* Read before the Section on Ophthalmology at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

TABLE 1.—*Findings in Cases 1-17: Near Point of Accommodation and Convergence, Depth Perception, Muscle Balance, Refraction, Fields, Color Vision and Extra-Ocular Conditions*

No.	Near Point O. D.	Near Point O. S.	Near Point of Conv.	Depth Perception, Cm.	Distance Vision O. D.	Distance Vision O. S.	Near Vision O. D.	Near Vision O. S.	Mydriatic O. D.	Vision with Correction	Mydriatic O. S.	Vision with Correction	Age
1	22	18	10	0.2	5/200	20/200	J19	J16	+2.50 cph. +0.50 cyl. ax. 90	20/70	+2.00 cyl. ax. 180	20/70-2	26
2	19	22	20	Could not see	20/50	20/70	J8	J10	+1.00 sph.	20/30	+0.50 sph. +2.00 cyl. ax. 60	20/30	28
3	25	27	12.5	2.06	20/20	20/20	J4	J6	+1.50 sph.	20/20-2	+1.50 sph.	20/20	39
4	22	21	10	2.68	20/50	20/40	J6	J8	+0.50 cyl. ax. 90	20/40	—0.50 cyl. ax. 180	20/30 pt.	25
5	13	38	18	2.60	20/20	20/70.1	J2	J10	+1.50 sph.	20/20	+1.50 sph. +0.75 cyl. ax. 135	20/30	28
6	28	27.5	14	0.32	20/30	20/50	J6	J8	+1.25 sph.	20/20	+1.25 sph.	20/30	32
7	33	9	14	10.41	20/200	20/20	J12	J4	+3.75 sph.	20/70	+2.00 sph.	20/30	33
8	19	18	5.5	8.61	20/70	20/30-2	J12	J12	+3.00 sph. +3.50 cyl. ax. 115	20/30-2	+3.50 sph. +3.00 cyl. ax. 75	20/30 pt.	29
9	23.5	30	14	4.23	20/30	20/30	J6	J4	+1.50 sph.	20/20-2	+1.00 sph. +0.75 cyl. ax. 90	20/20	29
10	22	22	5	5.8	20/30	20/40	J4	J8	—0.50 sph. +1.00 cyl. ax. 90	20/30	—0.50 sph. +1.00 cyl. ax. 90	20/50	34
11	24	24	11	6.1	20/30	20/50	J6	J16	+4.50 sph.	20/20	+5.00 sph. +0.50 cyl. ax. 180	20/30	28
12	18	24	5	1.68	20/40	20/40	J8	J14	+1.50 sph. +0.50 cyl. ax. 90	20/30	+1.00 sph. +1.00 cyl. ax. 90	20/30	31
13	29	24	12	1.28	20/20	20/20	J2	J3	+1.50 sph. +0.25 cyl. ax. 180	20/20	+1.25 sph. +0.25 cyl. ax. 90	20/20	32
14	30	17	5	1.1	20/30	20/40	J10	J2	+0.50 cyl. ax. 90	20/20	—0.50 cyl. ax. 180	20/20	33
15	30	34	3	1.48	20/100	20/100	J12	J10	—0.50 sph. +1.75 cyl. ax. 90	20/30	—0.50 sph. +2.00 cyl. ax. 90	20/30	27
16	22	18	12.5	Unable to take	5/200	5/200	J10	J18	+10.00 sph.	20/70	+10.00 sph.	20/100	28
17	21	26	9.5	0.96	20/100	20/200	J19	J20	+2.50 sph.	20/50	+2.50 sph. +0.50 cyl. ax. 90	20/50	34

No.	Postmydriatic Distance Correction O. D.	Vision	Postmydriatic Distance Correction O. S.	Vision	Addition for Near O. D.	Vision	Addition for Near O. S.	Vision	Fields O. D.	Fields O. S.	Color Vision
1	+2.00 sph. +0.50 cyl. ax. 90	20/50	+0.50 sph. +2.50 cyl. ax. 180	20/40	+2.00 sph.	J10	+2.00 sph.	J4	Normal	Normal	Color ignorant*
2	+0.50 sph. +0.25 cyl. ax. 90	20/30	+2.50 cyl. ax. 70	20/30-2	+1.00 sph.	J3	+1.50 sph.	J4	Normal	Normal	Normal
3	+0.25 sph.	20/15 pt.	+0.50 sph.	20/20	+0.75 sph.	J1	+0.50 sph.	J1	Normal	Normal	Almost normal
4	—0.50 cyl. ax. 180	20/40	—0.50 sph. —0.50 cyl. ax. 180	20/30-2	+1.50 sph.	J2	+2.00 sph.	J2	Normal	Normal	Normal
5	+0.25 sph.	20/15pt.	—0.50 sph. +0.75 cyl. ax. 135	20/40	None	J1	+1.00 sph.	J3	Normal	Normal	Normal
6	+0.75 sph.	20/20	+0.50 sph.	20/20	+1.50 sph.	J1	+1.50 sph.	J1	Normal	Normal	Normal
7	+3.75 sph.	20/70	+0.25 sph.	20/20	Unimproved	....	+0.75 sph.	J1	Contracted	Normal	Normal O. S., poor O. D.
8	+3.50 cyl. ax. 120	20/30pt.	+1.00 cyl. ax. 75	20/20pt.	+1.50	J2	+1.75 sph.	J2	Normal	Normal	Normal
9	+0.50 sph.	20/20	+0.25 cyl. ax. 40	20/20-2	+1.00 sph.	J3	+1.00	J3	Contracted	Contracted	Misses light shades
10	—1.00 cyl. ax. 10	20/20pt.	—1.00 cyl. ax. 180	20/30	+1.00 sph.	J3	+1.50 sph.	J4	Normal	Normal	Misses lighter shades
11	+1.25 sph.	20/20	+1.00 sph. +0.50 cyl. ax. 180	20/30-3	+1.50 sph.	J1	+2.00 sph.	J3	Normal	Normal	Normal
12	+0.50 sph. +1.05 cyl.	20/20pa.	+0.25 sph. +1.00 cyl. ax. 90	20/20	+2.00 sph.	J1	+1.50 sph.	J1	Normal	Normal	Color blind
13	+0.50 cyl. ax. 180	20/20	+0.25 cyl. ax. 180	20/20	+0.50 sph.	J1	+0.75 sph.	J1	Very small†	Same	Normal
14	—0.50 cyl. ax. 180	20/20	—0.50 cyl. ax. 180	20/20	+1.50 sph.	J4	.....	...	Very small	Same	Color blind
15	—2.00 cyl. ax. 180	20/30	—2.00 cyl. ax. 180	20/30	+1.00 sph.	J2	+1.00 sph.	J2	Very small	Same	Normal
16	+8.00 sph.	20/70	+8.50 sph.	20/100	+3.00 sph.	J6	+2.50 sph.	J16	Contracted	Same	Normal
17	+1.50 sph.	20/50	+1.50 sph. +0.50 cyl. ax. 90	20/70	+2.00 sph.	J8	+2.00 sph.	J8	Contracted	Same	Normal

No.	Muscles	Ocular Condition Besides Refractive Error	Extra-ocular Condition Endonasal and General
1	1° exophoria; 1° left hyperphoria.....	O. D., parenchymatous keratitis necessitating optical iridectomy; O. S., iridocyclitis	None
2	Internal alternating squint; 3½° esophoria; 1° left hyperphoria	None	Chronic purulent otitis media
3	Orthophoria	None	Chronic myocarditis
4	Orthophoria	None	Neurasthenia; deflected septum (submucous done)
5	Orthophoria	O. S., iridocyclitis (arrested).....	Deflected septum
6	1° exophoria	O. D., pterygium, nasal side.....	Deflected septum (submucous done)
7	Orthophoria	O. D., optic atrophy (tuberculous).....	Pulmonary tuberculosis; laryngitis
8	Could not be tested.....	None	Neurasthenia; deflected septum
9	1° exophoria	.....	Pulmonary tuberculosis
10	3° esophoria	O. S., pterygium (buried); O. S., chr. dacryocystitis (rapid dilatation)	Neurasthenia; deflected septum
11	Orthophoria	None	None
12	4° exophoria	None	None
13	1° exophoria	Optic atrophy, which improved under antisyphilitic treatment	Syphilis; migraine
14	Orthophoria	Argyll Robertson pupillary reaction.....	Neurosyphilis; deflected septum
15	1° exophoria	Tuberculous retinochoroiditis	Pulmonary tuberculosis
16	Internal alternating squint (could not be tested with phorometer)	Cherry-red spot in each macula.....	None
17	4° exophoria; 1½° left hyperphoria.....	None	Neurasthenia

* Especially light shades. † Normal after treatment.

blindness occurs; exophoria couples with good depth perception, esophoria and hyperopia with poor depth perception. Many cases of general infections, cardiorenal, neuropsychiatric, and endonasal conditions are found among those who have premature presbyopia.

Delaware Trust Building.

ABSTRACT OF DISCUSSION

DR. W. O. LAMOTTE, Wilmington, Del.: Out of 2,000 persons, between 1 and 40 years of age, whose eyes were refracted, 1,254 females and 746 males, additions for near vision were prescribed for forty-four, thirty females and fourteen males. There were nineteen between 35 and 40, eight between 30 and 35, five between 25 and 30, three between 20 and 25, seven between 15 and 20, two between 10 and 15. For forty-two of the forty-four, glasses were prescribed for both distant and near vision. Most of the patients between 35 and 40 complained of symptoms in near work, and the near point without distance correction was receded. In this series of forty-four, one patient had diabetes; at least one had syphilis; one, who had myopia, with paralysis of the right oculomotor nerve from a fall, could read better with an addition for the involved eye, and the paralysis, except full accommodation, had disappeared in about six months; one had paralysis of accommodation from an infected tooth, the accommodation being fully restored four months after extraction of the diseased tooth. Eight patients had myopia ranging from 4 to 14 diopters, and were given additions in several instances to prevent unnecessary strain of the eyes. Fuchs says that "presbyopia is not a disease, but a physiologic process which every eye undergoes." I would not call a case of syphilis with paralysis of accommodation or paralysis of accommodation from a diseased tooth or from any other known disease a premature presbyopia. Dr. Bonner says that the majority of his patients had hyperopia. In my series, however, there were thirteen cases of myopia, one of myopic astigmatism, and eight of mixed astigmatism in one or both eyes. This leaves, therefore, a little less than 50 per cent. in which there was hyperopia or hyperopic astigmatism. The American Encyclopedia of Ophthalmology says that persons with hyperopia become presbyopic in proportion as the hypermetropia is of higher degree; and, as Dr. Bonner says, there is a relation between hyperopia and premature presbyopia. These statements are true so far as persons with hyperopia have to have reading glasses before those with emmetropia and myopia; but in my experience with correction for distance they do not have to have glasses for near vision any sooner than in any other cases made emmetropic with lenses for distant vision. However, we find a number of cases, more usually cases of hypertropia, in which additions are required for near vision because of high esophoria for near vision.

DR. WILLIAM F. BONNER, Wilmington, Del.: In this series of cases, presbyopia was considered premature, when occurring at the age of 40 or under. Cases in which the poorness of near vision was overcome by the distance correction were not considered presbyopic. Many patients with intra-ocular lesions had a poorness of near vision, which refraction did not correct. Hyperopia was the most common refractive error in this series, but among these were cases of myopia and mixed astigmatism. Many of these patients with correctable poor near vision had other pathologic conditions of the eye. Contracted fields were associated with focal and general infections. In the one exception to this, mentioned in the paper, the

TABLE 2.—*Findings in Cases 18-29: Refraction, Muscle Balance and Extra-Ocular Conditions*

No.	Distance Vision O. D.	Distance Vision O. S.	Near Vision O. D.	Near Vision O. S.	Mydriatic O. D.	Vision with Correction	Mydriatic O. S.	Vision with Correction	Age	Postmydriatic O. D.	Vision
18	20/40	20/40	J10	J10	+2.50 sph.	20/30	+3.50 sph.	20/30	37	+0.50 sph. +0.25 cyl. ax. 60	20/20
19	20/200	20/200	J10	J10	+0.50 sph. +0.50 cyl. ax. 90	20/15	+0.50 cyl. ax. 90	20/20	28	+0.50 sph.	20/15
20	20/70	20/70	J10	J8	+1.50 sph. +2.00 cyl. ax. 90	20/30	+1.50 sph. 2.00 cyl. ax. 90	20/30	32	+2.00 cyl. ax. 90	20/30
21	20/50	20/200	J6	J14	—0.50 sph. +0.75 cyl. ax. 55	20/30	—0.75 sph. +1.25 cyl. ax. 120	20/50	37	—0.75 cyl. ax. 145	20/30
22	20/40	20/50	J12	J14	+0.75 sph.	20/30	+0.75 sph. +0.50 cyl. ax. 90	20/20	27	+0.50 sph.	20/30
23	20/30	20/200	J10	J14	+1.50 sph.	20/30	+1.50 sph.	20/40	36	+0.50 sph.	20/20
24	20/70	20/50	J4	J3	+1.50 sph. +1.25 cyl. ax. 90	20/30	+2.00 sph. +0.50 cyl. ax. 90	20/30	30	+1.00 cyl. ax. 90	20/30
25	20/20 pt.	20/20	J10	J4	+0.50 sph. +0.25 cyl. ax. 90	20/20	+0.50 sph. +0.25 cyl. ax. 90	20/20	40	+0.25 cyl. ax. 75	20/20
26	20/100	20/70	J10	J10	+1.00 cyl. ax. 180	20/200	—0.50 sph. +1.00 cyl. ax. 35	20/70	29	—4.00 cyl. ax. 30	20/50
27	20/30	20/100	J1	J14	—0.50 sph. +1.50 cyl. ax. 75	20/20	+1.50 cyl. ax. 60	20/70	32	—0.50 sph. —0.50 cyl. ax. 165	20/15
28	20/30	20/20	J4	J4	+0.50 sph.	20/15	+0.50 sph.	20/20	37	+0.25 sph.	20/20
29	20/200	20/70	J10	J10	+3.50 sph. +1.00 cyl. ax. 90	20/70	+2.00 sph. +2.00 cyl. ax. 90	20/10	34	+2.00 sph. +1.00 cyl. ax. 90	20/70

No.	Postmydriatic O. S.	Vision	Addition for Near O. D.	Vision	Addition for near O. S.	Vision	Muscles	Ocular Condition Besides Refractive Error	General Condition
18	+2.00 sph. +0.50 cyl. ax. 90	20/20	+1.50 sph.	J2	+1.75 sph.	J2	Orthophoria	None	Neurasthenia
19	+0.50 sph.	20/15	+0.50 sph.	J1	+1.00 sph.	J1	Orthophoria	None	Myocarditis
20	+2.50 cyl. ax. 90	20/30	+0.50 sph.	J3	+0.50 sph.	J3	1° exophoria	None	
21	—0.50 sph. —1.25 cyl. ax. 30	20/30	+0.75 sph.	J6	+1.00	J6	Orthophoria	None	
22	+0.50 sph. +0.25 cyl. ax. 90	20/20	+1.25 sph.	J2	+1.25 sph.	J2	Divergent squint, 4° exophoria	.....	Pulmonary tuberculosis
23	+0.50 sph. +0.50 cyl. ax. 90	20/30	+2.00 sph.	J3	+2.50 sph.	J4	Orthophoria	.....	Pulmonary tuberculosis
24	+0.50 sph. +0.50 cyl. ax. 90	20/30	+1.00 sph.	J2	+1.00 sph.	J3	1° esophoria; ½° right hyperphoria	.....	Died of acute cardiac dilatation
25	+0.25 cyl. ax. 105	20/15	+1.25 sph.	J2	+0.75 sph.	J2	1° exophoria	None	Chronic interstitial nephritis; empyema of antrum
26	—3.50 cyl. ax. 145	20/50	+2.00 sph.	J4	+2.00 sph.	J4	Not taken	None	
27	—1.00 cyl. ax. 150	20/70	.....	J1	+2.00 sph.	J3	Not taken	None	
28	—0.50 sph.	20/15	+1.25 sph.	J2	+0.75 sph.	J2	Not taken	None	
29	+2.00 sph. +2.00 cyl. ax. 90	20/70 plainer	+1.75 sph.	J2	+1.50 sph.	J2	Orthophoria	None	

patient gave a negative Wassermann reaction of the spinal fluid. Ordinarily in cerebrospinal lesions, spinal fluid examinations would be sufficient, but in this case a blood Wassermann test, done after the paper had been published, gave a four plus reaction. There were many cases of muscular weakness. Depth of perception was good in cases of exophoria, and poor in cases of esophoria and orthophorio with high hyperopia. In this series of ex-service men, there were twenty out of 204 in which there was premature presbyopia. The relationship to others who were not ex-service men was about the same as in Dr. LaMotte's cases. As there were many cases of premature presbyopia associated with focal and general infections, and cardiorenal, neuropsychiatric and endonasal conditions, therefore those with premature presbyopia should have a thorough physical and neurologic examination. This collaboration was enjoyed in the United States Veterans' Bureau.

THE CLINICAL RESULTS WITH FLUMERIN IN SYPHILIS *

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There is no field of medicine so difficult, and yet so widely exploited, as the chemotherapy of syphilis. The last few years have witnessed the introduction of a host of new drugs, arsenical, mercurial and bismuth preparations, designed to supplant existing methods of treatment. Unfortunately, these preparations have been only too often prematurely introduced on the basis of insufficient experimental evidence by overenthusiastic investigators, or worse, of unwarranted therapeutic claims made by unscrupulous manufacturers. As Stokes [1] has recently pointed out, the average practitioner is not sufficiently familiar with the mechanism of drug action in syphilis to enable him to judge the value of new preparations, so that before a drug is made available for general distribution, all possible information regarding its use should be placed before the profession. For this reason the present paper will provide in detail the clinical results of the use of flumerin, the disodium salt of hydroxymercurifluorescein, in a considerable series of syphilitic patients.

This drug, developed from the chemical and toxicologic standpoints by E. C. White, has been thoroughly studied in rabbit syphilis by J. H. Hill. Some details of these phases of the work, together with a general statement of its clinical trial, carried out under the direction of one of us (J. E. M.) in the syphilis department of the medical clinic, were given in a preliminary report.[2] Since the publication of our first paper, the drug has been placed in the hands of other investigators, to whose results some reference may now be made. J. A. Kolmer,[3] A. S. Loevenhart,[3] and C. H. Browning [3] have confirmed our statements as to the extremely low toxicity of the drug for animals (minimum lethal dose of 30 to 40 mg. per kilogram of body weight for mice, rats, rabbits, and dogs) and Kolmer [3] has demonstrated that, in common with other mercurials,[4] flumerin has no action on trypanosome infections.

Hill's work on rabbit syphilis has been extended [5] to show that not only are single large doses (30 mg. per kilogram) curative, but also that a biologic cure, so far as may be determined by negative lymph node transfers from treated animals, may be obtained with ten daily repeated doses of 5 mg. per kilogram. She has further pointed out, as have also numerous other investigators in the field of experimental syphilis, that similar results cannot be obtained with repeated injections of other mercurials in common use, such as mercuric cyanid, salicylate, or red mercuric iodid, the dosage of these drugs employed in her experiments being comparable to average therapeutic doses in man. Though flumerin possesses no trypanocidal activity, it is spirocheticidal, as shown by animal experiments, and to an extent not shown by other mercurials.[6] Repetition of a few details regarding our therapeutic routine is desirable.

Flumerin is a dark red powder, freely soluble in distilled water, and suitable for clinical use in a concentration of 2 per cent. Though solutions of the drug are stable for several days, we have always used freshly prepared solutions. Injections were made intravenously, repeated treatments being easily possible because of the nonirritating qualities of the drug and the complete absence of thrombosis. The interval between doses was usually two or three days, a series consisting of not less than five injections. The majority of our patients received an average dose of 3 mg. per kilogram of body weight, though to fifteen patients 4 or 5 mg. per kilogram was given. It must be emphasized that in all cases reported in this paper, except in a special group, flumerin was the first treatment given, and that in no instance was arsphenamin or any other drug administered during the period of flumerin treatment. We see no accurate way to evaluate the worth of a drug, if its effect must be measured in conjunction with that of another preparation.

In all, 117 patients in the syphilis department were treated with flumerin during the seventeen-month period of this investigation. Of these, twenty-two cases have been discarded, chiefly because of insufficient treatment, leaving ninety-five cases for consideration. For purposes of study, these have been subdivided into four groups: early syphilis (primary and secondary), thirty-four cases; late syphilis (with tertiary lesions), twenty-nine cases; latent syphilis (Wassermann positive), twenty cases; miscellaneous, twelve cases.

THE EFFECT OF FLUMERIN IN EARLY SYPHILIS

In order to economize space, the details of our thirty-four cases are summed up in Table 1, so that only a summary of results is necessary in the text.

Healing of Lesions.—Six patients had chancres only on admission. In five of these, the lesion was healed by flumerin, but an average of twenty-six days and six doses of the drug was required to produce this result. The average is made artificially high by Case 11, in

* From the Syphilis Department of the Medical Clinic, Johns Hopkins Hospital.

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TABLE 1.—*Results of Flumerin Treatment in Primary and Secondary Syphilis**

Case Number	Lesions	Number of Doses of Flumerin	Average Dose, Gm.	Total Dose, Gm.	Average Dose per Kilogram, Mg.	No. of days to Heal Lesions	No. of Doses to Heal Lesions	Blood Wassermann Reaction at Time of Dose 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Number of Months Followed After Flumerin	Character of Subsequent Treatment	Clinical Relapse	Subsequent Course of Blood Wassermann Reaction	Cerebrospinal Fluid: Time Elapsed Since Flumerin	Cerebrospinal Fluid: Result	Comment
12	Chancre	7	0.20	1.40	3	58	6	0	0	0	0	0	0	0	..	..	..	..	..	..	..	..	..	..	11	Regular	None	Always negative	4 mo.	Negative	Cure?
17	Chancre	12	0.19	2.38	2+	30	5	4	4	4	4	4	4	4	4	4	1	0	2	0	..	..	..	16	Regular	None	Two recurrences during arsphenamin	3 mo.	Negative	.....
21	Chancre	11	0.16	1.76	3	23	11	4	4	4	4	4	4	4	4	4	4	4	..	..	..	..	..	..	10	None	None	Suggestive negative 10 mo. later	9 mo.	Negative	.....
28	Chancre	9	0.20	1.80	3	Unhealed		0	0	0	0	0	0	0	0	0	..	..	..	..	..	..	..	..	9	Regular	Two recurrences during arsphenamin	Always negative	6 mo.	Group II	.....
86	Chancre	13	0.18	2.38	3	14	6	0	0	0	0	0	0	0	0	0	0	0	0	0	..	..	..	..	4	Regular	None	Always negative	.....	Negative	Cure?
112	Chancre	9	0.36	2.40	4.5	7	4	4	4	3	0	4	3	0	0	0	..	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
5	Rash	5	0.20	1.08	3	12	5	4	2	4	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
7	Papulopustular rash	8	0.13	1.04	3	20	8	4	4	4	4	4	0	0	0	..	..	..	..	..	..	..	..	..	20	Regular	None	Always negative	.....	.....	Cure?
9	Papular rash	11	0.20	2.20	3	16	6	4	4	4	4	4	3	4	0	0	0	0	..	..	..	..	..	..	1	None	None	Always negative	.....	.....	.....
12	Condylomas	8	0.20	1.60	3	30	8	4	4	4	4	4	4	4	0	0	..	..	..	..	..	..	..	..	15	Regular	None	Always negative	10 mo.	Negative	Cure?
13	Papular rash	11	0.18	1.98	3	16	6	4	4	4	4	4	4	4	4	2	0	0	0	..	..	..	..	..	5	Regular	None	Always negative	.....	.....	.....
15	Rash	6	0.20	1.20	3	18	6	4	4	4	4	4	4	..	..	..	..	..	..	..	..	..	..	..	3	Regular	None	Suggestive negative after 3 doses arsphenamin	.....	.....	.....
24	Alopecia	10	0.22	2.20	3	10	5	4	4	4	4	4	4	4	4	4	4	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
31	Papular rash	4	0.11	0.45	3	Unhealed		4	4	4	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
34	Mucous patches	12	0.18	2.21	3	Unhealed		4	4	4	4	4	4	3	0	2	2	0	4	0	..	..	..	..	14	Regular	One recurrence during arsphenamin	One recurrence during arsphenamin	.....	.....	.....
66	Pustular rash	16	0.16	2.60	3	Unhealed		4	4	4	4	4	4	4	4	2	4	0	0	0	0	0	0	0	..	.....	.....	.....	.....	.....	.....
70	Rash	17	0.18	3.21	3	7	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	Regular	None	Negative after 5 doses 606	.....	.....	.....
73	Papular rash	14	0.20	2.80	3	14	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	..	..	9	Irregular	None	Always negative	9 mo.	Group II	.....
74	Papular rash	12	0.15	1.80	3	18	7	4	4	4	4	4	4	4	0	0	0	0	0	..	..	..	..	..	5	Regular	None	Always negative	3 mo.	Group III	.....
75	Rash	13	0.19	2.48	3	9	5	4	4	4	4	4	4	4	4	4	4	4	1	4	4	..	..	..	6	Regular	Recurrence during arsphenamin	Always negative	2 mo.	Negative	.....
79	Rash	16	0.17	2.85	3	30	8	4	4	4	4	4	4	3	0	0	2	0	1	2	2	4	0	8	Irregular	One recurrence during 205	Always negative	2 mo.	Negative	.....
80	Rash	11	0.19	2.14	3	10	5	3	0	0	0	0	0	0	0	0	0	0	..	..	..	..	..	..	7	Regular	None	Always negative	5 mo.	Group II	.....
82	Condylomas	13	0.20	2.60	3	12	6	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	..	10	Irregular	None	Always positive	8 mo.	Group III	.....
83	Rash and mucous patches	15	0.13	1.90	3	51	13	4	4	4	4	4	1	3	1	1	3	1	0	4	?	?	..	..	5	Regular	None	Negative after 2 doses 606	5 mo.	Group I	.....
88	Papular rash	12	0.16	1.96	3	21	6	4	4	4	4	4	4	0	0	0	0	0	0	0	..	..	..	..	8	Irregular	None	Always negative	7 mo.	Negative	Cure?
89	Condylomas	10	0.18	1.80	3	10	5	0	0	0	0	0	0	0	0	0	0	0	..	..	..	..	..	..	3	Regular	None	Always negative	.....	.....	.....
90	Papular rash	11	0.20	2.20	3	21	6	4	4	4	4	4	4	4	4	4	4	4	4	0	..	..	..	..	2	Irregular	None	Negative after last dose flumerin	.....	.....	.....
97	Rash and mucous patches	15	0.30	4.54	4.5	5	3	4	4	4	4	4	2	4	1	0	3	0	0	0	0	0	..	..	5	Regular	None	Always negative	2 mo.	Negative	Cure?
98	Moist papules	15	0.26	3.96	4	7	3	4	0	4	4	4	3	0	2	0	0	0	2	0	0	0	..	..	2	Regular	None	One recurrence with arsphenamin	.....	.....	.....
103	Papular rash	6	0.25	1.50	4	9	5	4	4	4	4	4	4	..	..	..	..	..	..	..	..	..	..	..	1	Regular	None	Negative after 3 doses arsphenamin	.....	.....	.....
104	Papular rash and mucous patches	13	0.26	3.44	4	Unhealed		4	4	4	4	4	4	4	4	4	4	4	0	4	4	..	..	..	..	.....	.....	.....	.....	.....	.....
106	Papular rash	11	0.27	2.93	5	21	9	4	4	4	4	?	2	3	1	0	0	0	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
108	Papular rash	13	0.26	3.46	5	28	13	4	?	4	4	4	4	2	0	0	2	0	0	0	..	..	..	..	4	Regular	None	Always negative	4 mo.	Negative	Cure?
110	Papular rash	11	0.18	2.02	4	10	4	4	4	4	4	4	4	4	4	4	4	4	3	3	0	..	..	..	..	.....	.....	.....	.....	.....	.....
111	Papular rash	12	0.33	3.99	5	19	8	4	4	4	4	4	4	4	4	4	1	?	0	0	..	..	..	..	8	Regular	None	Always negative	.....	.....	.....

* In this and subsequent tables, blood Wassermann reactions are given a numerical value on a scale of four plus; 4 corresponding to positive, 3 to suggestive positive, 2 to doubtful, 1 to suggestive negative, and 0 negative. The character of subsequent treatment is indicated by "regular," provided the patient was at once transferred from flumerin to our routine of courses of arsphenamin, alternating with courses of mercury by inunction and continuing this during the period of observation, and as "irregular" if at any time during subsequent observation there is a lapse without treatment for a month or more.

which the treatment was markedly irregular, more than two months being required to complete seven injections of flumerin. In Case 78, the chancre was unhealed, but this patient had a very resitant infection, with two subsequent recurrences under arsphenamin. His record is given in detail in our first paper. None of these patients subsequently developed secondary syphilis.

In twenty-eight patients with various lesions of early secondary syphilis, all lesions were healed in twenty-four instances, in an average of seventeen days and six plus doses. The therapeutic effect exercised by repeated doses of 4 or 5 mg. per kilogram was slightly greater than when 3 mg. per kilogram was employed, but not markedly so. In four patients, not all lesions had healed after four, twelve, sixteen and thirteen doses, respectively. In each of these instances, rashes disappeared promptly, but mucous lesions persisted, a result not uncommon with other mercurials. In one case (79), mucous lesions containing spirochetes recurred during treatment with flumerin.

At the completion of flumerin treatment, our patients were transferred to our regular routine antisyphilitic treatment, namely, courses of arsphenamin alternating with courses of mercury by inunction. Twenty-seven of the thirty-four early cases were followed for periods ranging from one to twenty months after flumerin was stopped, the average being seven months. The character of their subsequent treatment is indicated in Table 1. In three of these twenty-seven patients, recurrences of lesions of a secondary type made their appearance shortly after the patient had completed a course of arsphenamin. In twenty-four, no clinical recurrence of any type was manifest during the period of observation. Seven patients have completed our serologic

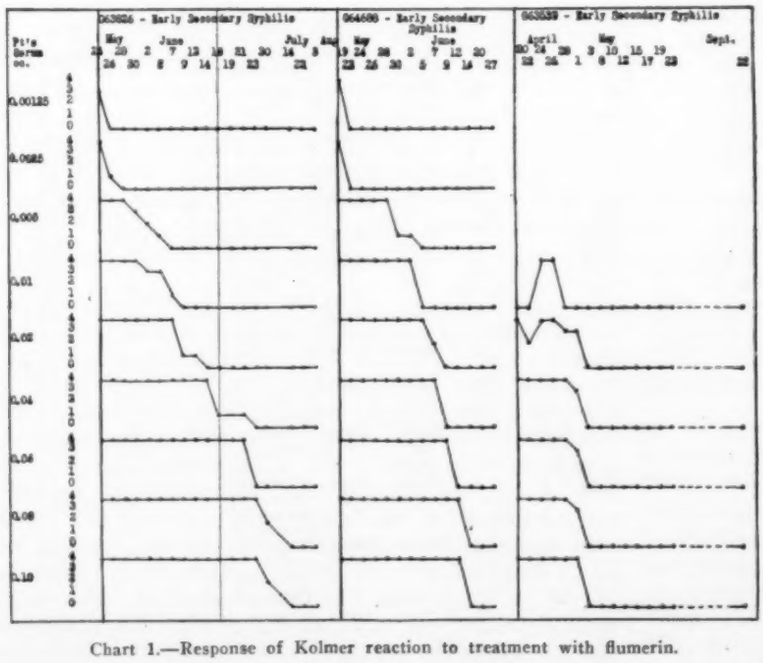

Chart 1.—Response of Kolmer reaction to treatment with flumerin.

requirements for probation,[7] and are regarded as instances of probable cure.

Effect on the Blood Wassermann Reaction.—Flumerin exerts a prompt and striking effect on the blood Wassermann reaction of patients with early syphilis. In three patients with seronegative primary syphilis, the reaction never became positive, either during or after flumerin treatment. Of the thirty-one patients with seropositive primary or secondary syphilis, the Wassermann reaction was reversed to negative in twenty, reduced in strength in one, and remained persistently positive during flumerin treatment in ten instances. The average number of doses necessary to reverse the

Chart 2.—A comparison between the composite Wassermann curves of a series of patients treated with flumerin and a large series of arsphenamin patients. Inasmuch as flumerin is given at two or three day intervals, and arsphenamin once a week, dose by dose comparison is misleading. The curves are therefore plotted on a rough time basis, two doses of flumerin for each dose of arsphenamin. Both the flumerin curve and the lower arsphenamin curve are based on the inclusion of patients with seronegative primary syphilis; the upper arsphenamin curve is based on early secondary syphilis only. The degree of fixation of the Wassermann reaction is expressed on a scale of four plus. Solid line, primary and early secondary; flumerin; thirty-five cases. Broken line, early secondary; arsphenamin; 343 cases. Line of dashes with hollow dots, primary and early secondary; arsphenamin; 511 cases.

test was nine plus, while to the ten peristently positive cases an average of ten plus doses was given. In five of these ten patients the test was later reversed to negative by arsphenamin; four of the ten took no subsequent treatment; and in the remaining instance, Wassermann fastness was explainable on the basis of a Group III spinal fluid.[7] In a few patients, repeated injections of 4 or 5 mg. per kilogram produced no more rapid Wassermann response than did the dose of 3 mg. per kilogram.

In only three instances was there a Wassermann recurrence during subsequent treatment or observation, while in fourteen patients the test remained permanently negative for periods ranging from three to twenty months.

As will be noted from the table, a blood Wassermann reaction was done at the time of each injection of flumerin, the technic employed being that described in a previous paper.[8] In a few cases, repeated tests were also done by the new Kolmer modification.[9] The results, as indicated by three specimen curves shown in Chart 1, leave no doubt as to the effect of flumerin on the Wassermann reaction.

7. Moore, J. E.: Studies in Asymptomatic Neurosyphilis, II, The Classification, Treatment and Prognosis of Early Asymptomatic Neurosyphilis, Bull. Johns Hopkins Hosp. **33**: 231 (July) 1922.

8. Keidel, A., and Moore, J. E.: The Wassermann Reaction in the Johns Hopkins Hospital, Bull. Johns Hopkins Hosp. **34**: 16 (Jan.) 1923.

9. Kolmer, J. A.: Studies in the Standardization of the Wassermann Reaction, XXX, A New Complement Fixation Test Based upon the Results of Studies in the Standardization of Technic, Am. J. Syph. **6**: 82 (Jan.) 1922.

A comparison of the Wassermann response of these thirty-four patients with the effect produced on the test by arsphenamin is shown in Chart 2. In the preparation of this chart, composite curves for each series (flumerin, thirty-four cases; arsphenamin, 511 cases) have been constructed in accordance with a previously described method.[10] The curves apparently indicate that flumerin is almost as efficacious as arsphenamin in reducing the reaction. It is certainly more active in

10. Moore, J. E.: Studies on the Influence of Pregnancy in Syphilis, I. The Course of Syphilitic Infection in Pregnant Women, Bull. Johns Hopkins Hosp. **34**: 89 (March) 1923.

TABLE 2.—*Results of Flumerin Treatment in Tertiary Syphilis*

Case Number	Lesions	Number of Doses of Flumerin	Average Dose, Gm.	Total Dose, Gm.	Average Dose per Kilogram, Mg.	No. of days to Heal Lesions	No. of Doses to Heal Lesions	Blood Wassermann Reaction at Time of Dose 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Number of Months Followed After Flumerin	Character of Subsequent Treatment	Clinical Relapse	Subsequent Course of Blood Wassermann Reaction	Cerebrospinal Fluid: Time Elapsed Since Flumerin	Cerebrospinal Fluid: Result	Comment
1	Nodular syphilid	8	0.11	0.90	3	12	6	4	4	3	?	2	4	0	0	..	..	..	..	..	..	..	..	1	None	None	Always negative	.....	.....	.....
3	Gumma of tonsil	12	0.15	1.81	3	15	5	4	4	2	2	2	2	0	4	0	0	0	0	0	..	..	..	2	Irregular	None	Recurred during course of arsphenamin	.....	.....	.....
4	Nodular syphilid	12	0.18	2.16	3	6	4	4	4	2	2	2	1	3	4	0	0	0	0	..	..	..	..	..	.....	.....	.....	.....	.....	.....
9	Gumma of leg	4	0.18	0.72	3	Unhealed		4	4	4	4	..	..	..	..	..	..	..	..	..	..	..	..	2	Regular	None	Negative by fourth dose of arsphenamin	.....	.....	Lesion not quite healed by arsphenamin
15	Gumma of skull	8	0.11	0.90	3	Unhealed		4	4	4	4	4	4	4	4	..	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
20	Gumma of leg	10	0.13	1.38	3	Unhealed		0	2	4	4	4	4	4	0	0	4	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
22	Gummas of skin	5	0.15	0.78	3	Unhealed		4	4	4	4	4	4	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
25	Nodular syphilid	9	0.15	1.35	3	21	9	0	0	0	0	0	0	0	0	0	..	..	..	..	..	..	..	16	Regular	None	Always negative	2 mo.	Negative	.....
29	Gumma of leg	12	0.17	2.08	3	58	12	4	4	4	0	4	1	0	1	4	0	0	0	..	..	..	..	..	.....	.....	.....	.....	.....	.....
30	Gumma of penis	12	0.18	2.17	3	Unhealed		3	4	1	0	4	4	1	4	2	0	4	0	..	..	..	..	8	Irregular	None	Recurred positive during arsphenamin	.....	.....	.....
32	Gumma of nasal septum	6	0.16	1.01	3	Unhealed		4	4	4	4	2	2	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
35	Gumma of leg	12	0.18	2.21	3	23	10	4	0	4	4	4	2	4	2	0	0	1	4	0	..	..	..	15	Irregular	One recurrence after arsphenamin	Always negative	14 mo.	Negative	.....
36	Gumma of chest	11	0.18	2.01	3	Unhealed		0	0	0	0	0	0	0	0	0	0	0	..	..	..	..	..	3	Regular	None	Always negative	.....	.....	Lesion not healed by one course of arsphenamin
39	Nodular syphilid	13	0.19	2.54	3	19	7	2	4	4	4	3	4	2	2	3	3	0	0	0	1	..	..	14	Regular	None	One recurrence with arsphenamin	2 mo.	Negative	.....
49	Gumma of sternomastoid	4	0.11	0.45	3	11	4	4	4	4	4	..	..	..	..	..	..	..	..	..	..	..	..	1	Regular	None	Always positive	.....	.....	.....
45	Gumma of leg	10	0.21	2.12	3	33	9	4	4	4	0	4	4	4	4	4	4	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
50	Periostitis of tibia	14	0.15	2.15	5	40	12	4	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	1	Regular	None	Always positive	.....	.....	.....
51	Nodular syphilid	15	0.21	3.23	3	14	6	0	4	2	0	1	4	3	4	4	4	?	4	?	?	0	..	13	Regular	None	One recurrence with arsphenamin	3 mo.	Negative	.....
54	Gumma of leg	12	0.13	1.63	3	42	12	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	..	12	Regular	One recurrence after arsphenamin	Always positive	.....	.....	.....
57	Gumma of leg	5	0.17	0.85	3	Unhealed		4	4	4	4	4	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
58	Gumma of skull	13	0.16	2.15	3	37	12	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	..	3	Irregular	None	Always positive	.....	.....	.....
60	Gumma of skull	9	0.16	1.42	3	28	9	4	4	4	4	4	4	4	4	4	..	..	..	..	..	..	..	10	Irregular	Recurrence 6 mo. after flumerin	Negative by fifth dose of arsphenamin	.....	.....	.....
63	Gumma of leg	13	0.12	1.58	3	16	6	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	12	Regular	None	Still positive	.....	.....	.....
66	Nodular syphilid	13	0.12	1.66	3	12	4	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	12	Regular	None	Always positive	.....	.....	.....
69	Ulcer right toe	14	0.13	1.83	3	19	8	4	4	4	4	4	4	4	4	?	?	?	2	0	3	0	..	..	6	None	Recurrence 5 mo. after flumerin	Always negative	.....	.....	Spinal fluid Group 3 6 mo. before flumerin
81	Leg lesion	13	0.18	2.34	3	Unhealed		4	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	8	Regular	None	Negative after 2 courses of arsphenamin	.....	.....	Lesion not affected by arsphenamin
94	Gumma of soft palate	8	0.14	1.19	2	38	7	4	4	4	4	4	4	4	4	4	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
105	Gumma of skull	12	0.17	2.10	3	28	11	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	3	Regular	None	Always positive	.....	.....	Lesion not quite healed by arsphenamin
107	Gumma of larynx	5	0.07	0.37	2	Unhealed		4	4	4	4	4	.	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....

this respect than other mercurials. This single point, however, is not to be interpreted as indicating the equality of the arsphenamins and flumerin, since the markedly inferior activity of flumerin in the healing of lesions is also to be considered.

The Cerebrospinal Fluid in Early Syphilis Following Flumerin Treatment.—A point of interest in this study was to determine whether the immediate use of flumerin instead of an arsphenamin in early syphilis increased the incidence of abnormal spinal fluids in this group of patients. Naturally, the small number of cases makes accurate comparison with arsphenamin statistics impossible. It may be said, however, that no neurorecurrences developed in the flumerin series, and that of fifteen patients in whom puncture was performed following flumerin, ten had completely normal spinal fluids. The incidence of fluid abnormalities in this group, 33 per cent., is about that of untreated early syphilis, suggesting that the use of flumerin has probably not rendered the nervous system more liable to invasion by the spirochete.

TABLE 3.—*Effect of Flumerin on the Healing of Lesions*

Type of Syphilis	Total Cases	Lesions Healed by Flumerin	Aver. Number of Days to Heal	Aver. Number of Doses to Heal	Unhealed		Aver. Number of Doses to Unhealed Cases
					Improved	Unimproved	
Early	31	26	21+	7+	4	1	11
Late	29	19	24+	8+	8	2	7+
of which gummas	22	12	29+	9+	8	2	7+
Nodular syphilids	6	6	14+	6+	—	—	—

In summary, then, a study of these patients with early syphilis indicates that flumerin has spirocheticidal properties to an extent not shown by other commonly used mercurial drugs; it heals the lesions of early syphilis with a fair degree of constancy and rapidity, exercising less effect than the arsphenamins, especially on mucous lesions; and it exerts a powerful effect on the blood Wassermann reaction.

THE EFFECT OF FLUMERIN IN TERTIARY SYPHILIS

Detailed information regarding twenty-nine cases of tertiary syphilis is given in Table 2. These patients were selected for flumerin treatment because the effect of the drug on the healing of lesions could be measured easily. Most of the patients had cutaneous gummas; several presented nonulcerative nodular syphilids, and a few had tertiary bone lesions.

Healing of Lesions.—In nineteen of the twenty-nine patients, all lesions were healed, an average of twenty-four days and eight doses of the drug being consumed in the process. Twelve of the patients had cutaneous gummas, ranging in size from 1 to 15 cm. in diameter. In six patients, nodular syphilids were healed promptly, the length of treatment necessary being considerably less than in the case of gummas. Comparative data with regard to the healing of early and late syphilis is shown in Table 3.

In ten patients, most of whom had large cutaneous gummas, complicated in two by underlying bone lesions, complete resolution of lesions was not accomplished by flumerin, an average of seven plus doses being given. There was marked improvement in eight of these, however, at the expiration of flumerin therapy. Two patients presented bone lesions absolutely unaffected by flumerin, both of which later proved resistant to arsphenamin also.

Recurrence of tertiary lesions developed in four patients, in each instance during a lapse following flumerin treatment. Fourteen patients were followed during routine antisyphilitic treatment for periods ranging from one to fifteen months, and in all of these further clinical progress was uneventful.

Effect of Flumerin on the Blood Wassermann Reaction in Tertiary Syphilis.—In five of the twenty-nine cases, the Wassermann reaction was reversed to a permanent negative by an average of nine doses of flumerin. In six additional cases, it was reduced in strength, but was not rendered permanently negative. The test was unchanged in two patients whose Wassermann reaction was negative at the beginning of treatment, while in sixteen it remained persistently positive during the administration of flumerin. Eight of these sixteen patients were subsequently treated with arsphenamin; in three, the positive test was reversed to negative by arsphenamin, and in five, the patients proved Wassermann fast after an average of eight months' combined arsphenamin and mercury therapy. A comparison of these figures with the Wassermann results obtained in early syphilis is shown in Table 4. No attempt is made to institute a comparison with arsphenamin results because of the small number of cases in the flumerin series and the irregular character of the Wassermann response.

As in the case of early syphilis, the results of flumerin in tertiary syphilis may be summed up in the statement that resolution of lesions was usually accomplished, and that, in some instances, a definite effect on the blood Wassermann test was noted. These results are not as rapidly obtained as with the arsphenamins, but seem equal to or better than the results from other mercurial drugs.

TABLE 4.—*Effect of Flumerin on the Blood Wassermann Reaction in Different Types of Syphilis*

	Total Cases	Wassermann Reaction Reduced to Negative by Flumerin	Average Doses Necessary to Reverse Wassermann Reaction	Wassermann Reaction Reduced in Strength	Wassermann Reaction Persistently Positive During Flumerin	Average Doses to Persistently Positive Cases	Wassermann Reaction Positive During Flumerin Changed to Negative by Arsphenamin	Made Negative by Flumerin; Later Recurrence	During Subsequent Treatment, Wassermann Reaction Remains	
									Negative	Positive
Early	31	20	9+	1	10	10+	5	3	14	1
Late	29	5	9+	6	16	9+	3	2	1	5
Latent	20	7	9+	3	10	16	—	3	3	10

EFFECT OF FLUMERIN IN WASSERMANN POSITIVE LATENT SYPHILIS

Twenty cases are in the group of Wassermann positive latent syphilis, only six of which, however, had not been previously treated. In these six patients, the blood Wassermann test was reversed to negative by flumerin in three (Cases 26, 32 and 45), though in two (Cases 26 and 45) a Wassermann recurrence developed during subsequent treatment. In the other three patients (Cases 37, 53 and 47), the blood Wassermann test remained positive after an average of nine doses of the drug.

The remaining fourteen cases are of particular interest, since in each instance some preceding treatment with arsphenamin and mercury had been given, the blood Wassermann reaction remaining persistently positive. The duration of previous treatment ranged from two to thirty-six months, with an average of eleven months. The results obtained with flumerin were not especially striking. The blood Wassermann reaction was reversed to negative in only four instances (Cases 27, 115, 116 and 117). In one of these (Case 116), the patient lapsed from observation on the completion of flumerin therapy; in a second (Case 117), there was a subsequent Wassermann recurrence; and in only two was the reversal to negative permanent. In the remaining ten patients, the test was still positive after an average of sixteen injections of flumerin, though its strength was reduced in three of these.

TABLE 5.—*Results of Flumerin in Latent (Wassermann Positive) Syphilis*

Case Number	Duration of Treatment Before Flumerin	Number of Doses of Flumerin	Average Dose, Gm.	Total Dose, Gm.	Average Dose per Kilogram, Mg.	Blood Wassermann Reaction at Time of Dose 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Number of Months Followed After Flumerin	Character of Subsequent Treatment	Clinical Relapse	Subsequent Course of Blood Wassermann Reaction	Cerebrospinal Fluid: Time Elapsed Since Flumerin	Cerebrospinal Fluid: Result	Comment
2	15 mo.	16	0.25	4.06	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	18	None	None	Always positive	.....	.....	Spinal fluid negative 1 year before flumerin
26	None	14	0.20	2.82	3	4	4	4	1	4	4	4	3	4	2	0	0	0	4	0	0	1	Regular	None	Recurred positive with arsphenamin	.....	.....	.....
27	7 mo.	10	0.16	1.62	3	1	4	4	4	4	4	0	0	0	0	..	..	..	..	..	..	10	Regular	None	None	3 mo.	Group III	.....
32	None	11	0.18	2.01	3	0	2	0	2	0	2	1	0	0	0	0	..	..	..	..	..	7	Regular	None	Always negative	3 mo.	Negative	.....
37	None	8	0.20	1.61	3	4	4	4	4	4	4	4	4	..	..	..	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
41	15 mo.	19	0.19	3.63	3	4	3	4	0	2	3	4	0	2	0	3	2	4	4	4	0	14	Regular	None	Always positive	11 mo.	Negative	.....
45	None	8	0.13	1.05	3	4	4	4	0	0	0	0	0	..	..	..	..	..	..	..	..	1	Regular	None	Recurred suggestive positive with arsphenamin	.....	.....	.....
47	None	9	0.18	1.65	3	4	4	4	4	4	4	4	2	4	..	..	..	..	..	..	..	2	Regular	None	Always positive	.....	.....	.....
53	None	12	0.16	1.95	3	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	3	Regular	None	Always positive	3 mo.	Negative	.....
56	2½ mo.	13	0.14	1.90	3	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	12	Irregular	None	Always positive	1 wk.	Group II	.....
62	19 mo.	16	0.18	3.03	3	2	4	4	4	4	4	4	2	4	2	3	4	4	3	4	4	12	Irregular	None	Always positive	10 mo.	Negative	.....
65	12 mo.	12	0.17	2.12	3	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	11	Irregular	None	Always positive	.....	.....	.....
77	15 mo.	15	0.16	2.50	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	.....	.....	.....	.....	.....	.....
92	4 mo.	5	0.12	0.60	3	4	4	4	4	4	..	..	..	..	..	..	..	..	..	..	..	3	None	None	Always positive	.....	.....	.....
98	8 mo.	15	0.20	3.07	4	4	0	4	?	?	2	3	0	1	2	?	0	0	4	0	..	3	Regular	None	Always negative	.....	.....	.....
113	14 mo.	12	0.10	1.10	2	4	4	4	4	4	4	4	4	4	4	4	4	4	..	..	..	11	Regular	None	Reduced by further arsphenamin	.....	.....	C. S. F. Group 2 1 year before flumerin
114	6 mo.	36	0.19	7.0	3	See comment.....																..	.....	None	See comment	.....	Negative	Patient Wassermann fast after 6 mo. arsphenamin; all further treatment flumerin; Wassermann reduced but not negative
115	36 mo.	24	0.13	3.15	2	See comment.....																..	.....	None	See comment	.....	Negative	Wassermann-fast for 3 yrs.; reduced permanently negative by flumerin
116	3 mo.	14	0.10	1.40	1.7	4	4	1	0	4	0	0	0	0	0	0	0	0	..	..	..	..	.....	None	.....	.....	Negative	.....
117	2 mo.	12	0.14	1.70	2	0	3	2	4	0	4	0	—	0	4	2	0	..	..	..	..	..	.....	None	Recurrence 2 mo. later	.....	Negative	.....

THE USE OF FLUMERIN IN PATIENTS INTOLERANT TO ARSPHENAMIN OR TO OTHER MERCURIALS

Twelve patients, all of whom had developed arsenical dermatoses or jaundice, or had been unable to take mercury by inunction because of severe stomatitis or cutaneous irritability, were treated with flumerin. In these patients, all lesions were healed and the blood Wassermann reaction was negative as the result of the previous treatment, so that the therapeutic effect of flumerin could not be evaluated. It is only necessary to say that in no instance was there a Wassermann recurrence during flumerin therapy, and that the drug was perfectly tolerated.

REACTIONS FROM FLUMERIN

In our first paper, the reactions observed from the use of this drug were so completely described that it is now necessary only to indicate their incidence in our complete series. This is shown in Table 6. In general, subjective symptoms were mild, but in eight cases, immediate vomiting, bloody diarrhea or stomatitis were of such severity as to interfere with further flumerin therapy. About a third of all the patients treated became salivated and developed mild stomatitis, usually after eight or ten injections of the drug.

Particular interest attached to the renal function findings in patients treated with repeated doses of 4 or 5 mg. per kilogram. So far as could be judged from repeated urine examinations and phenolsulphonephthalein tests, no permanent kidney damage was done, though in this group transient albuminuria or cylindruria was slightly more frequent than in patients treated with 3 mg. or less per kilogram.

RESULTS OF OTHER INVESTIGATORS

As stated in the earlier portion of this paper, a few investigators have been supplied with flumerin, and as the result of their work certain points of interest appear. A small number of patients were treated under the direction of Schamberg.[3] The doses given were

small, practically always less than 3 mg. per kilogram, and the doses were spaced at longer intervals than those in our own series. While our patients were treated every other day, or at least twice a week, the interval in Schamberg's series averaged 5.6 days. With this small dosage and long interval between doses, therapeutic effects were slight, and the rapidity of resolution of lesions and the Wassermann response were not comparable to the results in our own series. It is possible to conclude from this result that, if tolerated, the minimum average effective dose of the drug in human beings is 3 mg. per kilogram, and the interval between doses three days, preferably two days.

Fox,[8] at New Haven, also has treated a small series of patients with late syphilis. He has used doses averaging 5 mg. per kilogram twice a week, and finds that in this dosage the drug is well tolerated, particularly with reference to the kidneys. The therapeutic effects are, as might be expected, less than with arsphenamin.

TABLE 6.—*Reactions from Flumerin*

Dose, Mg. per Kilogram	Total Number of Patients	Total Number of Doses	Immediate Nausea or Vomiting	Cramps or Diarrhea	Stomatitis	Urine Examinations: No Change	Urine Examinations: Existing Abnormalities Cleared up Under Treatment	Urine Examinations: Transient Albuminuria or Casts During Treatment	Phenolsulphonephthalein Output: No Change	Phenolsulphonephthalein Output: Increased Plus 15 or More	Phenolsulphonephthalein Output: Decreased Minus 15 or More
From 2 to 3 mg.	...	1,068	41 (3.87%)	31 (2.93%)	..	..	..	..	..	..	..
	102	.....	..	..	37 (36.2%)	..	..	..	..	..	..
	77	.....	..	..	..	50	10 (12.9%)	17 (22%)	..	..	..
	61	.....	..	..	..	..	..	..	49	9 (14.7%)	3 (4.9%)
From 4 to 5 mg.	...	122	..	3 (2.2%)	..	..	..	..	..	..	..
	15	.....	..	..	5 (33%)	..	..	..	..	..	..
	15	.....	..	..	..	9	2 (13.3%)	4 (26.6%)	12	3 (20%)	..
Total.....	...	1,180	41 (3.47%)	34 (2.88%)	..	..	..	..	..	..	..
	117	.....	..	..	42 (35.9%)	..	..	..	..	..	..
	92	.....	..	..	..	59	12 (13%)	21 (22.8%)	..	..	..
	76	.....	..	..	..	..	..	..	61	12 (15.7%)	3 (3.9%)

SUMMARY OF THERAPEUTIC EFFECT AND REACTIONS FROM FLUMERIN

In man, flumerin is well tolerated in dosage of 5 mg. per kilogram given every other day, though an occasional patient will show signs of intolerance from this or smaller amounts. It is therapeutically active in early and late syphilis in doses of not less than 3 mg. per kilogram, given at least as frequently as twice a week. Smaller doses or longer intervals than this markedly impair the efficaciousness of the drug.

SUGGESTIONS FOR THE APPLICATION OF FLUMERIN TO THE TREATMENT OF SYPHILIS

Though the exact mechanism by which mercury acts in syphilis is not as yet thoroughly understood, it is known that it is but weakly spirocheticidal as compared with arsphenamin. Animal experimentation has demonstrated that for most mercurial preparations, the minimum single dose required to heal syphilitic lesions equals or exceeds the maximum tolerated dose. By contrast, flumerin produces healing of testicular chancres in the rabbit in single dose of 20 mg. per kilogram, and is tolerated in dosage twice as large. Its therapeutic ratio is thus 2:1, an index not equaled by any other mercurial with which we are familiar. The extremely low toxicity of the drug also permits the introduction of a large percentage of metallic mercury, which, as may be seen from Table 7, is more than three times as great in a given time period as is possible with other comparable mercurial salts, whether soluble or insoluble.

Since, in man, saturation with flumerin produces the same signs of intolerance as other mercurials, notably stomatitis and enteritis, and exerts the healing effects detailed on the lesions of syphilis, it is fair to assume that its general pharmacologic action is that of mercury. Its field of usefulness is therefore the same as for other mercurials, with the additional advantage of its higher therapeutic ratio.

While it is obvious that flumerin is not the equal of any of the arsphenamin group, and that it cannot replace them, the qualities enumerated for it suggest its place in syphilotherapy. By virtue of its superior spirocheticidal activity, its major field would seem to be complementary to arsphenamin in the treatment of primary and secondary syphilis. At this stage of the infection we are faced with a situation which demands the utmost in destruction of organisms, combined with the maximum conservation and stimulation of the patient's defense mechanism. Furthermore, it is at this time only that a cure, in the sense of radical destruction of all organisms, may be obtained. Later in the course

TABLE 7.—*Amount of Metallic Mercury in Therapeutic Doses of Flumerin and Other Mercurials*

Drug	Mercury Content, per Cent.	Average Therapeutic Dose, Mg. per Kilogram	Average Therapeutic Dose, Gm.	Metallic Mercury in Average Therapeutic Dose, Mg.	Amount of Metallic Mercury Given in Average Week, Mg.
Mercuric cyanid.....	79	0.33	0.02	15.8	94.8
Mercuric oxycyanid...	85	0.165	0.01	8.5	51.0
Mercuric benzoate.....	45	0.33	0.02	9.0	54.0
Mercuric chlorid.....	74	0.33	0.02	14.8	88.8
Mercuric succinimid...	54	0.25	0.015	8.1	48.6
Red mercuric iodid....	44	0.25	0.015	6.6	39.6
Mild mercurous chlorid (calomel).....	85	0.75	0.045	38.2	38.2
Mercurial (gray) oil*..	100	1.5	0.09	90.0	90.0
Mercuric salicylate....	54-59.5	1.5	0.09	53.1	53.1
Flumerin.....	33	5.0	0.25-0.3	100.0	300.0

* The therapeutic dose of mercurial oil is expressed in terms of metallic mercury.

of the infection our utmost achievement is clinical arrest of the disease process.

No patient with early syphilis should be given flumerin until after the usual course of arsphenamin has been administered. Nor should the two drugs be used simultaneously. For reasons chiefly related to the biologic course of syphilitic infection, we are opposed to the intermittent plan of treatment for early syphilis, this plan implying the combined use of arsphenamin and mercury separated by rest periods. Our plan of use for flumerin, therefore, is that it shall be applied as interim continuous treatment, to be given between courses of arsphenamin. Even the iodids should not be used simultaneously with flumerin because of the theoretical possibility of enhancing its toxicity by the formation of a halogen mercurial compound in the body.

In early syphilis, then, we would advise a course of treatment somewhat as follows: arsphenamin for eight doses at the usual intervals of five to seven days, followed a week after the last dose of arsphenamin by a series of flumerin injections given every other day, the first two doses of 3 mg. per kilogram, then two of 4 mg., and then eight of 5 mg. per kilogram. Immediately at the completion of flumerin treatment, a second series of six injections of arsphenamin must be given, again followed in one week by a second series of sixteen injections of flumerin. This type of alternating treatment with arsphenamin and flumerin should be continued until the usual criteria of cure are fulfilled (one full year's treatment after permanently negative serologic findings of the blood and spinal fluid are obtained).

The dosage of 5 mg. per kilogram should not be exceeded, nor should the two or three day interval between doses be shortened unless the functional condition of the patient's kidneys is under accurate control. It is considered advisable to reach this level of dosage if possible, but a strict insistence on the application to man of the minimum curative dose in animals is unnecessary. Not only have we obtained almost as satisfactory therapeutic results, as shown by a study of our tables, with a dosage of 3 mg. per kilogram as with the larger doses, but in human syphilis the end to be attained with mercury is fundamentally different from that in animal experimentation.

It is obvious that this suggested plan of treatment calls for a considerable sacrifice of time (and inevitably of money) on the part of the patient. Such sacrifice should not be demanded by the physician unless the therapeutic gain is adequate. For any given patient, the ideal plan of treatment for syphilis is that which combines maximum therapeutic possibilities with economy of time and money. We believe that in early syphilis, the advantages of flumerin therapy outweigh the economic consideration. In late syphilis, on the contrary, this situation does not so definitely obtain. We therefore do not advise the routine use of flumerin in this stage of the infection, preferring to leave its application to the necessities of the individual case. In neurosyphilis and in resistant syphilis in general, we feel that little more is to be expected of flumerin than of other active mercurials. Flumerin may be expected to prove of value in arsphenamin-intolerant patients, notably those having had reactions of the dermatitis group. In our hands, furthermore, good results have been obtained in a small number of patients who failed to tolerate mercury by other routes.

The field of application of flumerin to antisyphilitic therapy is thus limited at present by the physical properties of the drug and the necessity of using it by the intravenous route. Studies at present in progress of its toxicity and rate of absorption and excretion when administered by the intramuscular route may later considerably widen its applicability. For the present, there are not sufficient data available to warrant the administration of flumerin by the intramuscular route.

THE DIAGNOSIS OF DIABETIC COMA*

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Unconsciousness in a patient who has sugar in the urine demands prompt use of the physician's utmost diagnostic skill, (1) to avoid hasty and harmful injection of insulin in unsuitable cases; (2) to adjust treatment to both diabetes and probable complications; (3) to protect the rights of the patient's family, and (4) to improve our knowledge of diabetes by more accurate tabulation of statistics.

The term "diabetic coma" should be reserved for unconsciousness (not mere drowsiness) due to diabetic acidosis. It is characterized clinically by "air hunger" (Kussmaul respiration), and chemically by an excess in blood and urine of sugar and of the end-products of faulty fat metabolism (the acetone bodies). Absence of any of these symptoms implies that the unconsciousness is not due solely to true diabetic acidosis, and that therefore it cannot be safely treated with large doses of insulin.

A gradual, not a sudden, onset characterizes uncomplicated diabetic coma. During the week preceding, such symptoms as anorexia, headache, abdominal cramps, weakness, nausea, vomiting, constipation and difficult breathing will have been present; these signs, though neglected by family and friends, can always be elicited on careful inquiry. The precipitating cause of these symptoms frequently appears to be a nervous upset or unusual exertion, but the real cause is always dietary error. The respiratory difficulty may have been noticed only occasionally during this prodromal period, with a definite increase during the few hours preceding unconsciousness. On examination, the deep, rapid respiration with exaggerated inspiratory effort, the dry skin and mouth, cold extremities, subnormal temperature, rapid pulse and soft eyeballs are immediately noted. The cheeks may be flushed, and at times an acetone odor may be detected on the breath. Flushed cheeks and a warm skin, when present, usually are seen in the prodromal stage before true coma has appeared. Shallow and feeble respiration succeeds "air hunger" as exhaustion progresses. A catheter specimen of urine and, when facilities are available for analysis, a blood sample also should be obtained immediately. Usually the percentage of sugar in the urine is but moderate, ranging from 1 to 3 per cent., whereas the blood sugar is relatively higher, ranging from 0.4 to 0.8 per cent. The urine gives a maximum red-black test with any ferric chlorid solution (preferably 30 per cent.) unless retention of ketone bodies has occurred. The carbon dioxid combining power of the blood plasma is usually below 15 per cent. by volume; when above 30 per cent. by volume, it betrays either a complication or the previous administration of alkali. The diagnosis becomes puzzling when these signs are obscured, or are complicated by the presence of other

* From the Diabetic Clinic, New England Deaconess Hospital.

factors; it is then essential for the physician to consider other conditions that may produce unconsciousness.

DIFFERENTIAL DIAGNOSIS

Differential diagnosis is often rendered difficult by the fact that in cases of severe diabetes the temperature, pulse rate and leukocyte count may not reflect so promptly or so clearly the existence of infection. In a patient whose usual temperature range is from 97 to 97.6 F., a temperature of 98.6 is equivalent to 100.4 in a normal person. Fever is not a symptom of diabetic coma; its presence indicates a complication. In most instances the differential diagnosis of the causes of unconsciousness in a diabetic patient lies between the following conditions:

1. Hypoglycemia in a diabetic patient may be due either (*a*) to inanition when no insulin has been given, or (*b*) to an overdose of insulin. The hypoglycemia of inanition usually follows a marked restriction of diet. Doses of insulin as low as one unit have been known to produce hypoglycemia. In either case the urine is free from sugar, the blood sugar below 0.06 per cent., the pulse rapid and weak, the pupils dilated, the face and arms moist with a cold sweat. Convulsions may occur, especially in children. Sugar immediately administered by stomach tube or glucose given intravenously cures, whereas insulin kills.

2. The onset of acute infection (such as otitis media) and gastro-intestinal disturbances are the chief causes of unconsciousness in children under 5 years of age. The presence of fever and the absence of the criteria mentioned require other explanation than that of diabetic coma.

3. Septicemia must be considered in any diabetic patient with severe acidosis, who has fever. A blood culture must always be taken. This applies with special force when a known focus of infection is present, such as a carbuncle, gangrene or an infected wound. Septicemia may originate in an infected tooth root or a paronychia as well as in a carbuncle, and may be the precipitating cause of true diabetic coma. Often, however, the acidosis resulting from the infection is not sufficient to cause coma, and the real cause of the patient's comatose state is septicemia due to staphylococcus or streptococcus infection. The diagnosis depends on the presence of a septic temperature, leukocytosis, petechiae in the skin, subconjunctival hemorrhages, metastases to joints, lungs and endocardium, and the results of repeated blood cultures.

The recognition of septicemia in such cases may protect important rights of the patient and his family. In a recent case at the New England Deaconess Hospital, trauma of the thigh had been followed by severe acidosis and fever. The recovery of hemolytic streptococci from blood cultures taken on admission, and the disappearance of acidosis under treatment, demonstrated that the patient's death was due to septicemia resulting from accident and not to diabetic coma, with the result that his family received compensation for his accident insurance policy. Death from septicemia consequent on an infected wound is death from accident; death from diabetic coma is death from disease.

4. Meningitis and encephalitis usually give evidences of irritation of the central nervous system. The history of headache, dizziness and drowsiness for a week or more, fever, pupillary changes, nystagmus, paralysis, stiff neck, reflex changes and stertorous respiration rather than "air hunger" indicate lumbar puncture and settle the diagnosis. A known diabetic patient, admitted to the New England Deaconess Hospital for treatment of diabetic coma, had a small abscess on the scalp which had been opened and drained several weeks previously. During the night before admission he was found comatose, with sugar and diacetic acid in the urine. Here the laboratory helped much. With a plasma carbon dioxid combining power of 46 per cent. by volume, diabetic coma was out of the question. Lumbar puncture revealed a purulent spinal fluid due to a streptococcus meningitis.

5. Uremia is bound to occur with increasing frequency among diabetic patients, because such persons are living to enter the uremic zone of old age. The history of chronic nephritis or prostatic obstruction, the presence of convulsions, the nephritic pallor, uremic odor, oliguria, albuminuric retinitis and, most important of all, nitrogen retention in the blood serve to distinguish it, as do likewise the absence of excessive quantities of diacetic acid in the urine or acetone in the blood. The nonprotein nitrogen of the blood in diabetic coma rarely exceeds 65 mg. per hundred cubic centimeters, but is seldom less than 100 mg. per hundred cubic centimeters in uremia. The blood sugar, however, may rise to 0.30 or 0.60 per cent. in the diabetic patient with uremia.

6. Cerebral hemorrhage, thrombosis or embolism occur suddenly, with resultant paralysis. Usually unilateral spasticity or flaccidity give the clue. In the aged, a series of vascular accidents may have preceded the present illness.

7. A brain tumor may prove most deceptive. A history of headache, dizziness, slowly progressing loss of sight or hearing, a tendency to fall to one side, and mental changes, together with choked disk, Cheyne-Stokes rather than the air hunger type of respiration, and abnormal reflexes will differentiate the condition from diabetic coma.

8. Epilepsy is extraordinarily rare among diabetic patients, but epileptic convulsions may cause the appearance of small amounts of sugar in the urine of a nondiabetic person.

9. Narcotic poisoning is distinguished chiefly by means of the history, the slow respiration, and the absence of ketonuria and lowered plasma bicarbonate. The pin-point pupils of poisoning by opium or its derivatives, and the odor of chloral or alcohol are helpful diagnostically, but the needle puncture marks of drug habitués must not be confused with those resulting from the use of insulin. Needle marks so situated that the injections could only have been made by another person, together with marked induration of the skin, suggest insulin rather than morphin.

10. Trauma with concussion of the brain or a fractured skull is mentioned as a reminder that a patient found unconscious with sugar and diacetic acid in the urine is not necessarily suffering from diabetic coma. Bleeding from ears or nose, wounds of the scalp, roentgen ray and blood chemistry differentiate the conditions.

Success in untangling the diagnostic snarl surrounding the unconscious diabetic patient may save his life, protect his rights, and increase knowledge of the causes of diabetic mortality.

The Percentage of Criminals.—Hardly any one knows that about 2 per cent. of the community is constantly criminal the world over, and that no matter what we do, no appreciable effect has ever been produced on this average of criminality. —Hoag: Crime, Abnormal Minds and the Law, Indianapolis, 1923.

ORBITAL CHANGES PRODUCED BY RADIUM IN CANCER OF THE UPPER JAW*

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It is now quite customary to supplement the operative treatment of cancer of the upper jaw by the application of radium. As a result of the radium application, definite changes may occur in the orbit and affect the eyeball. These changes, aside from deleterious action on the eyeball, suggest extension of the malignant growth, and the question then arises whether the orbit and its contents should be exenterated or not.

It seemed, therefore, of importance to study the condition in the orbit which radium produces when applied in the treatment of tumors of the upper jaw, and to compare this with the neoplastic involvement of the orbit in the course of tumors of the upper jaw.

The following five cases of orbital involvement after radium treatment present certain features which bear on this question.

REPORT OF CASES

CASE 1.—E. J. B., aged 61, had been operated on for carcinoma of the upper jaw and then treated with radium, which was followed by diplopia, and the left eye had been red for six weeks. The inferior rectus involvement was increasing. The recurrence in the upper wall of the antrum had been noted by the attending rhinologist, and the question of exenteration of the orbit was raised. The patient was seen by me, Jan. 6, 1920, by the courtesy of Dr. Alexander Duane of New York. The vision in the left eye was 6/8. All muscles were paralyzed except for some motility up and out. Examination revealed: exophthalmos, left, 17; right, 15; ciliary congestion; pupil moderately dilated; field contracted below; optic nerve, normal. In the upper part of the fundus there was a sharply defined, round detachment which was translucent in places. Six weeks later the condition was much better. There was no congestion; motility had returned inward; up and down was abolished. Exophthalmos was: left, 15½; right, 15. The interior showed no detachment, with pigment changes outlining the margin of the old detachment. Four months later, lateral motility was restored; the patient could move the eye slightly upward; there was complete paralysis of downward motion.

CASE 2.—I. M., aged 40, had been operated on at the Mayo Clinic for sarcoma of the left antrum. Radium was applied, Feb. 17 and March 20, 1922. Six weeks before I saw the patient the left eye became red, and sight was affected. The patient was seen by me, May 25. The left eye was totally blind. The lids were closed, red and swollen. The eye was fixed, bulging forward and out. The pupil was dilated; there was no light perception. The fundus showed the picture of embolism, with exudation in the deeper layers of the retina about the nerve head. The retinal veins were dilated, and were surrounded by hemorrhages; some of the vessels showed distinct interruption. There was a cherry spot at the macula. The margin of the disk was blurred with a grayish-white exudate, which extended upward under the retina; at the same time, no particular elevation was to be noted. There was a very definite mass to be felt along the orbital margin down and out. There was an opening in the canine fossa which contained packing. June 6, the eyeball was excised because of pain. The conjunctiva was very difficult to dissect, as it was thickened and adherent. The eyeball was firmly attached to the surrounding tissues, particularly below and throughout the entire posterior half. It was not possible to rotate the eye, and this made dissection very difficult, with the result that the eye collapsed, evidently being cut into. The parts posterior to the eyeball were transformed into a dense tumor mass obliterating the optic nerve. There was a large gap down and in, in Tenon's capsule, about 3 by 2.5 cm., which communicated with a cavity in the ethmoid cells and antrum, a large sloughy opening extended through the sclera, opening into the eyeball and coinciding with the gap in Tenon's capsule. An intensely putrid, greenish material and a piece of bone were removed.

CASE 3.—M. H., aged 70, had been operated on for a carcinoma of the antrum, and radium had been applied both externally and in the antrum. The upper bony wall was found defective in the roentgenogram. The treatment was followed by the usual swelling of the orbit. The eye appeared well except for constant pain. The swelling then went down gradually. One week before I saw the patient there was more exophthalmos, and an exudate appeared in the anterior chamber. The patient was seen by me, July 1, 1920, through the courtesy of Dr. Quick of New York. The skin of the lids was red and swollen. There was a very tender periosteal swelling along the orbital floor; there was exophthalmos; the anterior chamber was filled with a purulent exudate; the cornea was intact. Three days later a small perforation occurred about 4 mm. down and in, in the sclera, which discharged pus freely. Subsequently the pain became severe. The sloughy scleral flap that presented itself below was cut away; there was an intensely fetid odor. The cornea then sloughed out. July 7, an evisceration was performed. Purulently infiltrated chunks of tissue were cut away, and the sclera was dissected out piecemeal, adherent to the tissues about a large opening below, leading into the antrum.

CASE 4.—F. J., aged 61, had had a tumor of the antrum removed by operation, and radium had been applied. Six weeks before I saw the patient the left eye began to swell; recently this swelling had increased. The patient was seen by me, Feb. 6, 1922. The left eye was pushed forward and up, with restricted motility, especially downward; there was edema of the lids and of the conjunctiva below. Within the lower orbital margin a diffuse mass could be felt. The pupil reacted to light; the eyeground was normal. June 29, 1922, there was less swelling; motility was better; there was nasal swelling of the left optic disk. The right optic nerve was normal. The swelling ultimately went down entirely, and the eye became normal.

CASE 5.—M. S. S., aged 47, had been treated four years before by the late Dr. Henry H. Janeway for carcinoma of the antrum by operation and radium. Six weeks before I saw the patient, the latter returned to the General Memorial Hospital with the eye distinctly elevated and slightly bulging, which Dr. Quick regarded as due to a probable tumor extension, as, on examination of the antrum, there was a definite involvement of the upper wall. No thickening of the orbital floor could be felt. Radium was applied both internally and externally, Jan. 23 and 24, 1923. This was followed by a tremendous reaction: swelling of the lids; swelling of the floor of the orbit, and restricted motility of the eye. March 14, I was able to examine the patient, and found a general redness of the lids and adjoining cheek, with diffuse thickening of the periosteum along the floor. Motility downward was abolished and restricted upward to a moderate degree. The eyeball was normal.

COMMENT

The neoplastic involvement of the orbit in the progress of tumors of the superior maxilla is quite different from the symptoms observed in these five cases. With the kind assistance of Dr. W. S. Stone of New York, I went over the histories of tumors of the superior maxilla which have been observed at the General Memorial Hospital, New York. In the cases in which the patients are living, the orbit was not involved in twenty-four and was involved in twelve. In the cases in which the patients died, the orbit was involved in thirteen and was not involved in eight. The involvement of the orbit, while it is frequent in the terminal stages of the disease when it is difficult to say where

* Read before the Section on Ophthalmology at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

the tumor originated, is infrequent in the early cases, and then occurs, according to Drs. Quick and Coakley, through the inner or nasal wall, or posteriorly through the floor. Inflammatory symptoms are absent, and the ocular muscle paralyses are not marked.

The swelling anteriorly, when radium has been applied, is different from the usual tumor growth and presents definite inflammatory symptoms, such as redness and edema of the lids, a diffuse thickening of the orbital floor, an involvement of the ocular muscles and especially of the inferior rectus, ciliary congestion of the eyeball, detachment of the retina, and optic neuritis. A necrotic process may extend in the orbit to the eyeball, causing a slough of the sclera, panophthalmitis, and destruction of the eyeball. Infection is here undoubtedly a factor, and is especially liable to occur when radium is applied near bone tissue, which is so easily devitalized; necrosis results, and infection cannot then be prevented. It must be borne in mind that the effects of radium—that is, of the gamma rays—are long deferred, for weeks and even for months.

The reaction of the orbital structures to radium seems to vary in degree, according to whether the bony floor is intact or not, and the symptoms are quite different from those caused by the usual extension of the neoplastic process, arising in the upper jaw.

It is necessary to use the destructive or caustic effects of the radium in these cases, as the results of radium treatment combined with operation seem definitely to be better than those by surgery alone; yet, the possible ultimate deleterious action of radium on the orbit and eye should not be overlooked.

10 East Fifty-Fourth Street.

ABSTRACT OF DISCUSSION

DR. GEORGE H. KRESS, Los Angeles: Apropos of Dr. Knapp's comments on some of the dangers in the use of radium, I will report a case, coming under my own observation, which had a most deplorable end-result. A man, aged 45, presented himself because of four large succulent pterygia, two on each eye, advancing over the corneal tissue. My associate in the eye service of the hospital did McReynolds transplantation operations upward. Before the end of the year, there had been a recurrence, and the man, coming to my service, I did a McReynolds transplantation operation downward. When I returned to service, in about eight months, the patient again presented himself, the four pterygia seemingly being larger and more succulent and more fibrous appearing than ever. Before resorting to skin grafting or similar measures, we decided to obtain the opinion of the attending radiologist at the hospital, to learn whether or not, in his opinion, radium might have a deterrent influence on these recurring growths. He advised its use, and gave the patient one single exposure to the two eyes, of minimum dosage and under proper precautions. Within a few days a bilateral uveitis set in, which was resistant to all methods of treatment. The left eye became altogether blind and was most sensitive and painful, and an enucleation was necessary. After the enucleation, the symptoms in the right eye subsided somewhat, but the visual acuity was reduced to about 6/20, and the eye still remains sensitive to light and gives the patient much distress. The two pterygia on this eye have not returned. The end-result in this case would tend to emphasize the points brought out in Dr. Knapp's paper concerning the dangers incident to the use of radium in the eyes, and the need of the utmost precaution in minimum dosage, and other precautions in case its use is decided on.

DR. PHILLIP C. MEANS, Santa Barbara, Calif.: I tried radium in what proved to be a hopeless case—cancer of the antrum, in a woman weighing 90 pounds (41 kg.), with a bad heart, and who wished to die, which makes a rather discouraging prognosis. We used 25 milliamperes for forty-eight hours twice in this case. Fifty milliamperes would have been better. Does Dr. Knapp find that shutting out the secondary rays by screening with rubber changes the effect on the connective tissue? Our roentgenologist said that we need not fear the effect on the bone. When this woman died, with an extreme necrosis and infection of the eyeball and the whole contents of the eye socket, there was necrosis not only through the floor of the orbit, but through the floor of the mouth, due to the cancer and not the radium. The use of radium in this case I believe saved the patient a great deal of suffering, as only two or three injections of morphin were necessary in a long drawn out fatal ending. She was not particularly susceptible to pain, but the pain in this case was not what we usually expect in such cases.

DR. ALLEN GREENWOOD, Boston: These cases are not common. I have under my care a patient who is being treated by radium following an operation for carcinoma of the antrum. We can tell pretty nearly the effect of radium treatment on him by the amount of prism it takes to correct the imbalance of the inferior rectus muscle. He has five or six pairs of glasses with a different strength of prism. He wears one strength awhile and then, after a treatment, the inferior rectus is so disturbed that it takes a double strength of prism to give him comfortable binocular vision. It looks as though the radium was disturbing him more than his original disease.

DR. EDWARD JACKSON, Denver: Although these cases are rare, when they arise they are extremely important and the issues are very grave. Many years ago it was pointed out that a case of malignant disease invading the orbit from neighboring cavities was not a good case for operation; that, in general, the patient would live longer, if not subjected to an operation. So, there is a disposition in such cases to rely more on radium in this region than elsewhere. Radium and the roentgen rays also have been regarded with suspicion, and they have been used with caution for fear of their effect on the highly differentiated tissues of the eyeball. Experience seems to show that it is not very dangerous to such tissues as the retina and the lens. But in this group particularly a good deal of evidence would seem to show that radium is extremely dangerous to bone and to the biologic line of connective tissues. Without any complete history of these cases that have been brought before us today, it looks from the symptoms, the course and the gross conditions that were observed that this is a matter of damage to the bone and connective tissue, and possibly the tendons.

DR. W. H. WILDER, Chicago: I should like to ask Dr. Knapp whether or not in the cases he reported there was much pain and suffering, as there is so frequently when the fifth nerve is involved by cancer of the jaw or cheek, and whether or not the application of radium relieved this pain. On this may depend somewhat our determination to use it. Such a cancer is a deadly thing, and if we can merely relieve the suffering of the patient it is worth something. The reason I ask is that some of my gynecologic friends who use radium a great deal in malignant conditions of the uterus assert most positively that, while it may not cure, it sometimes checks the growth to a certain extent, and does reduce the great suffering and marked hemorrhage that are likely to occur. If we could relieve the pain in a disease that is almost necessarily fatal, we should be accomplishing something, even if the eye should be lost in the process.

DR. GEORGE MCCOY, Los Angeles: In a case of cancer of the eyeball that started in the lids, the patient received roentgen-ray and radium treatment in Los Angeles and also in New York. He went to Denmark and received some treatment there. Later he came to San Francisco and received radium treatment. The lids were burned so that they could not open or close. There occurred an ulcer of the cornea, a hypopyon, and he agreed to have the orbit exenterated. We took out the eye, the inner wall of the orbit, the upper wall of the antrum and the sac. The cancer went on for about three and a half years. It ate out the bony wall so that one could see the pulsations of the brain above. The patient died. That patient sought relief for his pain by radium. He would come up to San Francisco, make the trip with his nurse and go back, because he said that for a few days he felt worse, but after that the pain was relieved. In another case there appeared what we diagnosed as epithelioma of the cornea, with a history of a pterygium that had been there for several

months. This was removed completely, and the conjunctiva brought over. Also the upper portion of the cornea was dissected away. The laboratory made a diagnosis of epithelioma. Radium was used. The eyeball was burned and cataract developed, and there was increased tension. This was done about a year and a half ago. He still has increased tension, but very little distress.

DR. R. W. MILLER, Los Angeles: A man, aged about 50, in ordinarily good health, came because of what he conceived to be nasal catarrh. He had a small, open sore just to the nasal side of the area corresponding to the site of the left infra-orbital nerve. The left naris, ethmoid area and antrum were practically filled with necrosed bone, polypi and degenerated tissues. My pathologist reported that carcinoma was present. The diseased structures were removed, as far as practicable, and the case referred for radium treatment. This was carried on through the naris and the fistula which soon formed in the anterior antral wall. The origin of the growth seemed to be in the left antrum. There was decided reaction and some pain following soon after the treatments, but most of the time the patient reported only moderate pain and felt that the treatment gave marked relief. The diseased tissues were much reduced in volume, and for a time the outlook for recovery seemed good. So well was the pain controlled that no opium derivative was required at any time in the course of the disease. It is noteworthy that there were no ocular symptoms worthy of mention, the vision remaining good, and no fundus changes were noticeable. The patient became more and more emaciated, and died of asthenia ten months from the time I first saw him. I neither saw nor heard from him for about two weeks until the day prior to his death. He had not been able to retain any food for several days, was subcomatose, and the abdomen was greatly retracted. Metastasis to the abdomen was suspected, but a necropsy was not permitted.

DR. ARNOLD KNAPP, New York: In answer to Dr. Means, the radium was applied unfiltered. Answering Dr. Greenwood, it may be interesting to say that in these cases the paralysis of the inferior rectus persisted. As to pain, in the mild cases apparently there was not much suffering, but in the two cases of panophthalmitis there was a great deal of pain, which seemed out of proportion to the amount of ocular inflammation.

CLINICAL EXPERIENCES WITH ETHYLENE-OXYGEN ANESTHESIA *

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AND
DEAN LEWIS, M.D.
CHICAGO

Several months ago, a preliminary report was published on the use of ethylene gas as an anesthetic in a series of 106 operative cases.[1] A previous report presented a rather detailed study of the physiologic action of the gas on the usual laboratory animals, including a number of normal men.[2] Since that time the number of operations performed at the Presbyterian Hospital, Chicago, has risen to some 800. In the preliminary communication on the clinical phases of the work, certain important facts received no mention at all, and others were ascertained only as the work progressed. Our attention was furthermore called [3] to some earlier literature on ethylene which we had overlooked in spite of what we considered a thorough search.[4] These reasons have prompted us to issue this report.

* From the Hull Laboratory of Physiology, University of Chicago, and the Presbyterian Hospital.

1. Luckhardt, A. B., and Carter, J. B.: Ethylene as a Gas Anesthetic: Preliminary Communication, J. A. M. A. **80**: 1440 (May 19) 1923.
2. Luckhardt, A. B., and Carter, J. B.: The Physiologic Effects of Ethylene, a New Gas Anesthetic, J. A. M. A. **80**: 765 (March 17) 1923.
3. New Anesthetics: Ethylene and Acetylene, editorial, J. A. M. A. **80**: 1383 (May 12) 1923.
4. Luckhardt, A. B., and Carter, J. B.: New Anesthetics: Ethylene and Acetylene, J. A. M. A. **80**: 1476 (May 19) 1923.

LITERATURE

Before presenting the reader with a brief chronological report on the real and alleged studies on the physiologic properties of ethylene, we emphasize the fact that the problem presented itself to us as reported in our first communication, and that it was completed without the slightest knowledge that any one had ever worked on the subject before. We welcome this opportunity to give credit to whomsoever it is due.

Preparation of Ethylene.—Whereas in a Latin text (Physica subterannea) Becker is credited with first generating ethylene, Priestly in his "Observations and Experiments relating to Various Branches of Natural Philosophy" refers in 1779 to Ingenhouss as the first man to generate ethylene. In 1781 it was prepared and its chemical and physical properties studied by Deimann, Paets, van Troostwayk, Bondt and Lauwerenbusch (1795). Berzelius prepared it and called it "elayl." [5]

Physiologic Properties.—According to Foy,[6] Mr. Thomas Numely used olefiant gas (i. e., ethylene) in 1849 in one midwifery case (rigid os) and in three other cases (malignant tumor, section of the adductors of the thigh, section of the inner hamstring muscles), but that subsequent practices showed that "continued inhalations produced dilatation of the pupils, muscular relaxation, vomiting, and death." In a brief unsigned article in the *Medical Press* [7] appears a similar statement:

> Simpson recognized its [i. e., ethylene's] anesthetic properties, but considered it too irritating to the mucous membranes to allow of its use in surgery. Mr. Nunneley, of Leeds, employed it as an anesthetic in many operative cases and from using a more pure chemical, did not find its irritating properties pronounced. It causes when inhaled less excitement than ether; it acts as a cardiovascular depressant and in overdoses produces death by centric respiratory paralysis. Its high price is a barrier to its general use.

A closer inspection of the literature, however, revealed that Foy had misquoted both the name of the investigator and the facts. In a letter to the editor,[8] Mr. Thomas Nunneley (not Numeley) of Leeds reports that he wishes to mention two anesthetics with which he had been experimenting, namely, "common coal gas" and the "chloride of olefiant gas" also known as the "hydrochlorate of chloride of acetyle," or "oil of olefiant gas," formerly called "Dutch oil" or the "oil of the Dutch chemists"—so called because Dutch chemists were the first to prepare and study in detail the properties of olefiant gas, which, when mixed with equal volumes of chlorin gas, produced the compound which Mr. Nunneley used. In another letter,[9] Mr. Nunneley acknowledges the receipt of a letter from Simpson and a pamphlet from Dr. Snow to the effect that both had used "Dutch liquid" as an anesthetic agent before him. He states, however, that he does not find the substance irritating, as described by Simpson. In a final letter to the editor,[10] Nunneley mentions using ethylene chlorid (Dutch liquid, elayl chlorid, S-dichlorethane) in the four cases misquoted by Foy. As late as last year (1922) Hewitt-Robinson [11] perpetuate this error by writing: "Ethylene or olefiant gas

5. Mayer and Jacobson: Lehrbuch der organischen Chemie, Leipzig, 1907, p. 836.
6. Foy, George: Anesthetics, Ancient and Modern, London, 1889, p. 70.
7. M. Press, Aug. 10, 1921, p. 103, under "Current Topics."
8. Prov. M. & S. J., Feb. 12, 1849, p. 98.
9. Prov. M. & S. J., Leeds, March 2, 1849, p. 138.
10. Anesthetic Effects of Chloride of Olefiant Gas, Prov. M. & S. J., March 5, 1849, p. 166.
11. Hewitt: Anesthetics and Their Administrations, Edited by H. Robinson, London, 1922, p. 21.

was administered by Nunneley of Leeds in 1849 to four patients; but it was found to be unsatisfactory in its action."

A careful search through the writings of Simpson [12] revealed that he had never used ethylene gas itself but, among other "volatile chemical liquids," the chloride of hydro-carbon" or Dutch liquid, called for a time "chloride ether," produced by allowing "equal parts of olefiant gas and chlorine" to interact with the formation of a "colorless oily liquid of peculiar sweetish taste and ethereal odor."

There is, therefore, no available evidence that ethylene gas itself was ever used in operative work as an anesthetic agent by either Nunneley or Simpson. In fact, Nunneley, in a large article whose comprehensive title [13] indicates accurately the nature of his inquiries, mentions thirty-seven compounds whose anesthetic action he studied on the lower animals. In this research he records eight experiments with olefiant gas (four kittens, two cats and two young dogs). The animals are described as "sleepy but with appearance of uneasiness," "breathing rather laborious," "struggled hard," "irregular breathing and convulsion, without, however, altogether losing sensation," "cried out and was distressed." Those being by far the most common findings recorded in his protocols, it was natural for him to conclude that olefiant gas "is not one of those which are likely to be used in practice. Not only would there be difficulty and trouble in preparing and preserving it, but it is not a safe and manageable agent; since, when employed in innocuous doses, the anesthetic is not complete; when used in large doses, death may not improbably be caused. Ten per cent. of the gas does not appear to produce such a degree of insensibility of any permanence as could be depended upon in a painful operation of even a moderate length; fifteen per cent., though causing total insensibility, also induces a dangerous condition, while life is speedily destroyed by from 20 to 25 per cent." In his final appraisal of the thirty-seven compounds which, in his opinion, merit further use, he mentions sulphuric ether, coal gas, chloric ether, hydrobromic ether, chloroform, chlorid of carbon and chlorid of olefiant gas. The last mentioned was used extensively by him in his operative work.

In the next to the last paragraph of a moderately long article on nitrous oxid gas, Hermann [14] mentions the fact that he had inhaled olefiant gas as well as other gases in order to note their effect on the sensorium. He states that he prefers to report his results later, but speaks of the gas having a narcotic action. He does, however, warn against the danger of the presence of carbon monoxid, and states that he himself was in a dangerous condition because of the inhalation of such impure gas. Ten years later (1874) he [15] simply states, without giving any data, that ethylene gas is feebly intoxicating (schwach berauschend), on the order of nitrous oxid. He likewise repeats the statement that he once was in a precarious condition because of a contamination with carbon monoxid.

Two years later, Eulenberg [16] quotes Müller to the effect that ethylene causes dizziness, nausea and fainting, and that in large concentrations it causes death due to apoplexy. He also quotes Davy as stating that a mixture of two volumes of ethylene and three volumes of air causes dizziness, headache, and a passing weakness of the extremities. Eulenberg himself denies toxic properties on animals except in concentrations of 30 per cent. ethylene and 70 per cent. air, when he noticed difficult breathing and death. In this concentration one rabbit showed after a short period of excitement a slowing of the respiration with a slight drunken condition; another, a slight anesthesia. A 1 to 3 per cent. ethylene-air mixture induced anesthesia in a pigeon; a 30 per cent. ethylene-air mixture killed the bird.

In 1885, Luessem [17] used a 75 per cent. ethylene-oxygen mixture on frogs, rabbits and one canary, with fatal outcome in several instances, presumably due to the presence of carbon monoxid. After laborious purification, he put two dogs and one guinea-pig to sleep with an 80 per cent. ethylene-oxygen mixture. He himself inhaled this mixture. After five minutes he experienced a slight sense of pressure in the head, somnolence, and increase in pulse rate from 80 to 84 Eighteen minutes later he noted weakness in the arms and legs, vertigo, and an uncertainty of gait, with rapid recovery on breathing air.[18] In weaker concentrations he noted similar but less pronounced effects. He concludes that a 70 to 80 per cent. ethylene-oxygen mixture produces after a variable period of excitement a "sleep which cannot be interrupted by auditory stimuli." No reference is made to its analgesic properties or to its possible use in surgery as a general anesthetic agent.

In the ensuing thirty-three years (1885 to 1918) no further work was done on ethylene gas. In that year Luckhardt and Thompson,[19] independently and without knowledge of the preceding work just reported, established on frogs, rats and on one dog not only the anesthetizing but also the analgesic properties of ethylene gas when administered in a mixture of 80 per cent. ethylene and 20 per cent. oxygen.

The preceding year, Cotton [20] reported work purporting to show that ethylenated ether had powerful anesthetizing and analgesic properties. In fact, Cotton expressed the conviction, since disproved by Stehle and Bourne,[21] and more recently by Dale, Hadfield and King, that absolute ether possessed no anesthetic action. In 1919, however, Cotton [22] seemed to ascribe the value of ether as an anesthetic agent to powerful synergists other than ethylene, for he writes: "Ethylene was made by textbook methods and added to absolute ether. It transformed absolute ether into a moderately good anesthetic, but the results were not comparable with those previously obtained; in fact, such ether was by no means as good as Squibb's. However, with careful synthesizing and research, anesthetic synergists of exceedingly high value and potency were finally obtained." What these synergists are Cotton does not state in this article. The inference is that they are present in Cotton-process ether.

In August, 1922, Luckhardt and Carter [2] finished the work on the physiologic properties of ethylene gas

12. Simpson, W. G.: Anesthesia, Hospitalism, Hermaphroditism, etc., New York, D. Appleton & Co.; 1872, pp. 165-166.
13. Nunneley, Thomas: On Anesthesia and Anesthetic Substances Generally. Being an Experimental Inquiry into Their Nature, Properties and Action. Their Comparative Value and Danger and the Best Means of Counteracting the Effect of an Overdose, Tr. Prov. M. & S. As., London, 1849, pp. 167-381. The reader may be interested in the nature of some of the compounds tested by Nunneley for their anesthetic action: aldehyd, iodoform, coal gas, benzol, camphor, naphtha, oil of turpentine, creosote, protoxid of nitrogen, hydrocyanic acid, conein, carbonic oxid, sulphuretted hydrogen and bisulphuret of carbon.
14. Hermann, L.: Ueber die physiologische Wirkungen des Stickstoffoxydulgases, Arch. f. Anat. u. Physiol., 1864, p. 521.
15. Hermann, L.: Lehrbuch der experimentellen Toxicologie, 1874, Hirschwald, pp. 276, 101.
16. Eulenberg: Gewerbehygiene, 1876, p. 398.
17. Luessem, F.: Ztschr. f. klin. Med. **9**: 397, 1885.
18. In this concentration, one of us (A. B. L.) was on one occasion completely anesthetized in fifteen seconds.
19. Data unpublished.
20. Cotton, J. H.: Canadian M. A. J. **7**: 769 (Sept.) 1917.
21. Stehle and Bourne: J. A. M. A. **79**: 375 (July 29) 1922. See also Dale, Hadfield and King: Lancet, 5192, 1923; also summary of this controversy in J. A. M. A. **81**: 1040, 1923.
22. Cotton, J. H.: Am. J. Surg. (Anesthesia Supp.) **33**: 34 (April) 1919.

on frogs, white mice, white rats, guinea-pigs, rabbits and dogs.

Brown,[23] working on mice, rabbits, cats and dogs, subsequently confirmed these results at a time when Luckhardt and Carter were establishing on themselves and others the anesthetic and analgesic properties of the gas.

April 27, 1923, Luckhardt and Carter [1] reported the first 106 cases in which operations were performed under ethylene gas at the Presbyterian Hospital, Chicago.

FURTHER REPORT ON ETHYLENE AS A GAS ANESTHETIC

We now turn to a short discussion of certain facts not mentioned in our first reports, and to certain observations made since they were published.

1. *Premedication.*—In no instance in this or the previous series of patients was morphin, scopolamin, or any other analgesic or soporific given purposely as an adjuvant for subsequent ethylene anesthesia. In a few instances, morphin had been given prior to operation for control of pain. Our experience, then, with but few exceptions, refers to the action of ethylene as the sole agent responsible for the analgesia and anesthesia. As might be expected, however, morphin is a powerful aid from every point of view, conducing not only to a more perfect relaxation in every case but particularly in the more resistant cases, as well as allowing an appreciable reduction in the concentration of ethylene and an increase in the percentage of oxygen necessary for complete surgical anesthesia.

It is well known that there are numerous reports in the literature on gas-oxygen anesthesia (N_2O-O_2) which in reality ought to be referred to as morphin-nitrous oxid-oxygen-ether anesthesia. The importance of the ether seems to be considered by many entirely negligible, even when one third or more of this powerful anesthetic is given during the greater part of an operation. We take occasion to emphasize the fact that neither morphin, scopolamin nor ether was used with the ethylene. As a result, we are spared the impossible task of evaluating their respective parts in the production of the anesthetic state.

2. *Concentration of Ethylene Used.*—The concentration of ethylene necessary to obtain and maintain the anesthetic state depends, as with other anesthetic agents, on a number of factors, of which the nature of the operation (extremity versus abdominal) and the patient himself (youth, muscular development, excitability of nervous system, alcoholism) are the most important.

In the first clinical report [1] it was stated that the average percentage of ethylene necessary for surgical anesthesia was about 82 per cent. With an increase in the number of abdominal operations, it was found that the percentage of ethylene necessary for a satisfactory surgical anesthesia state lay close to 90 per cent. (87.6 per cent.), at any rate during such parts of the operation as involved the greatest amount of manipulation of the abdominal viscera and parietal peritoneum. If a short time (five minutes or more) is allowed for the thorough saturation of the patient with the anesthetic, operative procedures are possible which could not have been consummated shortly after induction. In fact, after a prolonged period of anesthesia, a deep anesthetic state may be maintained on a much lower percentage (80) of ethylene than is required early after induction.

23. Brown: Canadian M. A. J., March, 1923.

3. *Postanesthetic Vomiting.*—Patients may vomit following any operative procedure, for a variety of reasons. Afferent impulses, chiefly of a painful sort, may reflexly induce emesis. So may morphin itself given for the control of pain. The anesthetic itself may stimulate the vomiting center by direct central action. Impurities in the anesthetic may be partly or wholly responsible for the vomiting. Any one of these, acting alone or in combination, may lead to nausea or emesis.

It is difficult to state definitely why one patient under ethylene vomits following a relatively simple operation (removal of small adenoma of breast) and another not after laparotomy; or why one patient vomits folowing an appendectomy and the other does not. The administration of morphin given because of postoperative pain seemed to stop the nausea and vomiting in some patients, and certainly induced it in others. As a general rule, any prolonged operation under ethylene, especially if abdominal in nature, is followed by some nausea and retching. Such patients may vomit once or twice within the first three hours; rarely more than three times. From 14 to 16 per cent. vomit once or twice on awakening. Since retching movements may occur during the period of induction, or when the patient is but lightly anesthetized, it would seem to be due to direct stimulation of the vomiting center by the ethylene itself (or impurities in it). At any rate, the vomiting, when it does occur, is never serious or prolonged. In our series, vomiting occurred on awakening or subsequently in 30.2 per cent. of the patients following ethylene and in 76.6 per cent. of the patients following ether anesthesia. Besides the marked difference in the occurrence of vomiting, the postanesthetic vomiting of the etherized patients was more severe and more prolonged.

4. *Gas Pains.*—The low incidence of postoperative gas pains was striking. Gas pains were noted in 4.2 per cent. of 119 cases, whereas 36.6 per cent. of patients operated on under ether anesthesia suffered from this postoperative discomfort.

5. *Safety of Ethylene Anesthesia.*—When ethylene gas is pushed to the limit in dogs, the respiratory center fails first and at a time when the force and frequency of the heart are quite normal. Artificial respiration quickly restores the animal.[24] During a three-hour period of administration to a dog, ethylene was given six times in concentrations necessitating artificial respiration. After we had ceased to administer ethylene, the animal recovered in ten minutes and appeared perfectly normal except for a temporary lack of appetite. In several instances a phenolsulphonephthalein test of kidney function was found to be normal on the day following a three-hour period of anesthesia. The rate of elimination by the kidneys of intravenously injected Ringer's solution remained unchanged. At no time did even a prolonged anesthesia lead to an albuminuria or a glycosuria.

6. *Cases Illustrative of Ethylene Anesthesia.*—In the article dealing with ethylene as a gas anesthetic,[1] we enumerated the various types of operation that had been

24. Since ethylene, like morphin, depresses the respiratory center, ethylene should be administered with greater caution to patients who have been premedicated with morphin. On theoretical grounds, we would, therefore, advise particularly strongly against the administration, in a morphinized patient, of the highly concentrated ethylene vapor for purposes of rapid induction. We feel that ethylene-oxygen anesthesia should never be forced. What Gwathmey has said so well concerning nitrous oxid-oxygen anesthesia in this connection (J. A. M. A. **81**: 1133 [Sept. 29] 1923) we feel is applicable to ethylene-oxygen and for the same implied reasons. The use of morphin prior to ethylene-oxygen anesthesia will forestall the possible necessity of ever forcing the ethylene-oxygen gas mixture.

performed under ethylene. To append another list of similar nature at this time would, it seems to us, serve no purpose. Suffice it to say that the gas has been used in almost every type of surgical procedure in which a general anesthetic was indicated. We did think, however, that the reader might be interested in the histories of a few cases illustrative of the action of ethylene on patients who were not premedicated.

RESECTIONS OF THE STOMACH

CASE 1.—L. G., woman, aged 50, had complained of severe pain in the epigastrium, referred to the back, and diarrhea for some months. These pains were associated with a marked loss in weight. At the time the first examination was made (July 17, 1923), a tumor could be felt in the epigrastrium. The pyloric end of the stomach could be palpated easily, as the patient was very thin. The mass palpated suggested somewhat a leather bottle stomach. The roentgen ray revealed a definite filling defect, limited to the pyloric end of the stomach. Films revealed a constant and superior impassable defect involving the end of the antrum up to the pyloric ring, confirming the fluoroscopic findings. Analysis of the stomach contents revealed a total acidity of 55; free hydrochloric acid, 39; combined and other acids, 16.

July 25, a resection of the stomach was performed, preceded by a gastro-enterostomy, the anastomosis being made well to the left. The right half of the stomach was resected. The resection was performed easily under ethylene anesthesia. Occasionally, some movements associated with gulping were noted. Peristaltic waves also were observed at times. These did not interfere with the operation. No difficulty was experienced until closure of the abdomen was attempted. The rectus muscles were at this time very rigid, but they relaxed immediately when more ethylene was given.

The patient recovered consciousness within three minutes after the anesthetic was discontinued. She gulped up some dark stomach contents while on the table. Twenty-four hours later she had hiccough for a short while, and gulped up several times a dark, blood-stained fluid. Nausea was not complained of following the operation. Recovery was good. It was noted during the operation that the skin was dry. There was no evidence of any bronchial irritation.

CASE 2.—A. R., a man, aged 50, entered the hospital, Sept. 23, 1923. Since July he had had diarrhea from time to time and noted a rapid loss of weight. He had lost from 30 to 40 pounds (13.5 to 18 kg.), and complained of feeling weak. The physician whom he consulted soon after the beginning of his illness made a roentgen-ray examination of the stomach and found a definite filling defect of the pyloric end. The findings were those of a carcinoma of the pylorus. At no time had there been obstruction or retention.

September 25, one half of the stomach was removed under ethylene, a gastro-enterostomy having first been performed well to the left of the greater curvature. The operation was performed without any difficulty as far as the anesthesia was concerned. The patient took the anesthetic well and without cyanosis. When an attempt was made to close the abdomen, the rectus muscles were very rigid. More ethylene was administered without relaxing the muscles sufficiently. Some ether was then administered. The patient recovered consciousness quickly, very little ether having been given. Following the operation the patient vomited once, 3 ounces of a dark, blood-stained liquid.

Recovery from anesthesia was rapid, no nausea being complained of except that associated with vomiting once of a dark-stained liquid, shortly after the patient was returned to his room. (This case is again referred to under "Failures.")

GASTRO-ENTEROSTOMY; PATIENT HAD PULMONARY TUBERCULOSIS

CASE 3.—E. G., a woman, aged 52, had for several years definite evidences of pulmonary tuberculosis. Eighteen months before entering the hospital, May 20, 1920, a gastro-enterostomy had been performed under ether because of a pyloric stenosis following the healing of an ulcer. Ethylene was administered on the present occasion, and a gastro-enterostomy was performed to the left of the one previously made. There was no evidence of any exacerbation of the tuberculous lesions in the lung.

The retention was not relieved by the second gastro-enterostomy, and as there was clinical evidence of a vicious circle, an enterostomy was made under ethylene between the loops of the intestine employed in making the gastro-enterostomy. There were no changes in the pulmonary lesion following these operations. Careful examinations were made to determine whether any extension of the tuberculous process could be detected. The patient recovered rapidly from the effects of the anesthesia. (Stomach retention is still noted. The patient seems to be improving, however, feeding being carried on through a jejunostomy made some six weeks before the entero-enterostomy was performed. The jejunostomy was performed under local anesthesia.)

AMPUTATIONS OF THE BREAST

CASE 4.—Mrs. A. O., aged 74, had noticed for over two years some tenderness in the left breast and some induration. Recently this induration had become more marked. The mass had all the clinical characteristics of a carcinoma. On entering the hospital, the patient had a systolic pressure of 260 and a diastolic pressure of 160.

Oct. 1, 1923, a radical removal of the breast was performed under ethylene. The anesthesia was very good. No cyanosis was noted. The respirations were even and relatively shallow. The patient was conscious on return from operating room. During the six hours immediately following the operation, the patient vomited small amounts three times. Vomiting then ceased. She remarked about the pleasant anesthesia, experiencing no discomforts during induction and waking up without realizing that an operation had been performed. No effect on the blood pressure was noted.

CASE 5.—A. O., a woman, aged 33, entered the hospital, June 6, 1923. During the preceding December, she had noted a nodule in the left axilla and experienced a heavy, tense feeling in the left breast. The mass in the breast presented all the clinical signs associated with a carcinoma.

Radical removal of the breast was performed, May 7, under ethylene. The anesthesia was good. The patient regained consciousness on the operating table. She complained, on the return of consciousness, of severe pain in the incision. Morphin was administered to the patient in the operating room. Nausea was not noted following operation. Recovery was rapid.

SUTURE OF THE ULNAR NERVE

CASE 6.—L. F., a man, aged 28, was riding in a mail truck which struck a trolley pole, Sept. 1, 1922. He was thrown through the wind shield and sustained two cuts on the inner side of the arm just below the elbow. He experienced considerable pain, which soon subsided, after which changes associated with an injury of the ulnar nerve were noted.

Aug. 8, 1923, under ethylene anesthesia, the ulnar nerve was exposed just below the internal epicondyle. The nerve was found to be almost entirely divided. A neuroma had developed.

Anesthesia was satisfactory, although at one time vomiting occurred and the arm which had been flexed across the patient's chest for the operation was moved by the motions associated with vomiting. A relatively large amount of light yellowish fluid was thrown up at this time. The vomiting was easily controlled.

The patient was conscious when returned from the operating room. No nausea or vomiting was noted after return to the ward.

RESECTION OF LOWER END OF RIGHT RADIUS AND BONE TRANSPLANTATION

CASE 7.—L. Y., a man, aged 34, had complained of pain in the region of the right wrist-joint for two months. Two weeks before entering the hospital he fell on the outstretched hand and injured the lower end of the radius, the pain becoming much more marked. A roentgenogram taken shortly after the accident revealed a shadow, an asymmetric expansion of the bone and a fracture. The fracture was pathologic, having occurred through a central giant cell sarcoma.

April 30, 1923, the lower end of the radius was resected, under ethylene, and a bone transplant taken from the anteromedial surface of the tibia was inserted. Anesthesia was very satisfactory. Considerable oozing was noted; no more than is encountered frequently in the soft tissues adjacent to malignant growths of bone. The patient vomited small amounts three times during seven hours following the operation. Consciousness was recovered quickly, and morphin was administered in the operating room because of pain.

PLATING OF FRACTURED FEMUR

CASE 8.—K. P., a woman, aged 40, admitted to the hospital, Aug. 10, 1923, seven days before had been struck by an automobile and sustained a fracture through the lower third of the left thigh. The fracture was transverse. The fragments were not in line and, because of the difficulty in maintaining reduction, an open operation was performed.

Operation was performed, August 10. Anesthesia was excellent. Difficulty was experienced in fixing the plate because of the disproportion in size between the drill points and the screws. The operation was unduly prolonged. Anesthesia was exceptionally good and smooth. It lasted one hour and a half. Recovery of consciousness occurred within three minutes. There was no nausea or vomiting following the operation.

REFRACTURE OF TIBIA AND FIBULA, WITH ATTEMPTED REDUCTION OF POSTERIOR DISLOCATION OF FOOT IN OLD POTT'S FRACTURE

CASE 9.—G. D., a man, aged 47, admitted to the hospital, April 9, 1923, during the preceding October had sustained a Pott's fracture (right side). A posterior dislocation of the foot had occurred with this. The dislocation had not been reduced, and as a result a very marked deformity had resulted. April 21, the original fracture through the fibula and tibia was reproduced under ethylene anesthesia, the ankle joint opened and an attempt made to reduce this dislocation. This was not entirely successful. The marked deformity was, however, corrected by inverting the foot to a marked degree.

The anesthesia was exceptionally satisfactory. It was continued for fifty-five minutes. The patient recovered within three minutes after the anesthesia was discontinued. He vomited a small amount once immediately after return to the ward.

7. *Failures.*—We have a record of seven more or less complete failures in a series of more than 700 operations, or about 1 per cent. of the cases. In order that the reader may better understand the nature and extent of the failures, the histories are briefly summarized. Before doing so we emphasize the fact, mentioned earlier in this paper, that none of the patients had been premedicated except one middle-aged man, who had received a small quantity of morphin from twenty to thirty minutes prior to the attempted anesthesia. Since he represents an individual who was unusually refractory to all anesthetic agents, including ether, we mention his history first and will then briefly refer to others.

CASE 10.—In a middle aged man, at two previous attempts at cystoscopic examination for suspected tuberculous ulceration of the bladder, nitrous oxid-oxygen anesthesia was attempted, but was entirely ineffective and ether was given. On this occasion ⅙ grain of morphin sulphate was given from twenty to thirty minutes prior to a 90 to 95 per cent. ethylene-oxygen anesthesia. The patient apparently relaxed one moment and then began mumbling in drunken fashion and began to writhe and struggle. After the patient had been saturated for from eight to ten minutes with ethylene-oxygen, he became quiet. The cystoscope was passed without reflex movements. When, however, the cystoscope was directed toward the vesical ulcer for its examination, the mumbling, writhing and struggling were resumed. Further attempts at saturation with ethylene-oxygen failed to induce the desired relaxation. Ether, therefore, was given by the drop method. During the administration of the first half pound of ether the patient continued to struggle, mumble, and adduct the lower extremities. Following the administration of the next quarter pound of ether the respiration became quite slow and regular (full morphin effect?) and the anesthesia was complete and very satisfactory. (Published with permission of Dr. Herbst.)

CASE 2.—A. R., a middle-aged man, who had received no premedication, was anesthetized with ethylene-oxygen. Anesthesia was satisfactory during resection of the pyloric end of the stomach and a posterior gastro-enterostomy. Proper surgical closure of the abdominal incision without a little ether was impossible because of the extreme rigidity of the abdominal musculature.

CASES 11 and 12.—Two middle-aged men were operated on for inguinal hernia. No premedication was given. Relaxation of the abdominal musculature was so unsatisfactory that the patients were etherized.

CASES 13 and 14.—Two young men, who had been given no premedication, had poor relaxation, so that cholecystectomy was impossible. In one of the cases subsequent etherization did not increase the relaxation in any striking manner.

CASE 15.—In a case of appendical abscess, the omentum had surrounded the perforated appendix, which was directed forward and medially. In an attempt to deliver the abscess, some difficulty was encountered. The muscle-splitting incision had been used, and was enlarged by being extended downward along the outer side of the rectus muscle. The mass of inflamed omentum was lying rather low. There was some rigidity of the abdominal muscles, which was not extreme. In order to secure more complete relaxation to permit of delivery of this mass without rupture of the abscess contained within the folds of the omentum, ether was administered.

ADVANTAGES OF ETHYLENE AS A GENERAL ANESTHETIC

A new anesthetic, to be deserving of a thorough trial, must have definite advantages over those already in general use. While the number of cases in which ethylene has been administered is small, a sufficient number have been observed to permit of a judgment of its advantages, which are very definite. These will be discussed under the heads: (1) ease of induction and rapidity of recovery; (2) relaxation without cyanosis; (3) absence of sweating; (4) absence of respiratory irritation, and (5) narrow anesthetic margin.

1. *Ease of Induction and Rapidity of Recovery.*—Patients can be anesthetized rapidly with ethylene, without struggling and without any sensation of suffocation. Absence of struggling or excitement is in the majority of cases very striking. The patients become anesthetic without any movement of the body, hands or feet. In some instances, when an operation was to be performed on the hands, the fingers have been rapidly flexed and extended a few times. When questioned, the patients state that they experienced no distressing or unpleasant sensations during induction of the anesthesia. In some abdominal operations it has been thought best to induce anesthesia slowly and to secure complete relaxation before making an incision. In some of these cases, eight minutes has been consumed in inducing anesthesia. Since marked analgesia apparently precedes complete anesthesia, operations in which complete relaxation is not desired may be begun early, after a few inhalations of the ethylene.

When anesthesia has been induced, respirations become regular and somewhat shallow. The respirations are neither grunting in character nor forced. The regular natural respiration is one of the striking advantages of ethylene anesthesia.

The ease of induction makes the ethylene-ether sequence preferable to the nitrous oxid-ether sequence. After 275 cases of ethylene-ether sequence, nitrous oxid is no longer used for induction of the anesthetic state.

The patient rapidly recovers from the anesthesia. Usually within two minutes after the anesthetic is stopped, the patient is awake and mentally clear. Return of consciousness occurs so quickly and the mind is so clear that patients frequently complain of pain in the incision, and morphin is frequently administered before the anesthetic is stopped, to prevent pain.

The figures that have been given indicate the frequency with which nausea and vomiting have been observed. The nausea seems to vary somewhat with the different tanks of ethylene that have been employed. Nausea, when present, usually occurs when the patient passes from the anesthetic to the waking stage. Frequently some gastric secretion lightly stained with bile is gulped up, no severe retching occurring. The vomiting ceases after this material is ejected, and nausea is no longer complained of. Hunger may be present within two hours after administration of the anesthetic.

In three cases, nausea not accompanied by much vomiting has persisted from eighteen to twenty-four hours. In one instance, tissue was removed from the breast and a frozen section made. The tissue removed proved to be malignant. A request to complete the operation if the tissue proved to be malignant was not granted. Later permission was obtained to do a radical operation, which was performed the next day. No nausea followed the second administration of ethylene. In another case, in which a rather large cyst was removed from the breast, nausea persisted for twenty-four hours, unaccompanied by much vomiting. In still another case, the appendix being removed, nausea accompanied by hyperchlorhydria persisted the greater part of twenty-four hours. These three cases are the exceptions to rapid recovery without nausea. As previously stated, the amount of nausea has seemed to vary with the different tanks of ethylene that have been employed. It has been thought that this nausea might be eliminated when a closer study of ethylene was made. It is quite probable that nausea can never be completely eliminated when a patient passes rapidly from the anesthetic to the waking stage.

There has been a striking absence of headache or postanesthetic distress. When leaving the table, patients converse intelligently; the mind is clear and remains so.

2. *Relaxation Without Cyanosis.*—Relaxation can be secured much better with ethylene than with nitrous oxid. Time should be taken in the induction to secure complete anesthesia. Relaxation is so complete that pelvic work can be performed easily. Gastro-enterostomies and stomach resections can be performed without difficulty.

Ethylene anesthesia is especially satisfactory in operations on the extremities. Complete relaxation is secured so that fragments of fractures may be easily brought into line and fixed. In one case mentioned above (an old Pott's fracture with a bad deformity and an unreduced posterior dislocation of the foot), both the tibia and the fibula had to be refractured, and it was necessary to resort to considerable force in attempting to replace the astragalus. During this operation, lasting fifty-five minutes, relaxation was complete. The anesthesia was very satisfactory.

Relaxation is secured without cyanosis. The color of the patient is more nearly nomal than with any other general anesthetic now employed. In some instances in which the anesthesia has been administered over a long period, the skin and mucous membranes may appear to be abnormally pink, a condition noted by Nunneley [13] and Luessem,[17] and attributed by the latter to vasodilatation. Because of this striking appearance, we intend to reinvestigate, in spite of our previous negative results, the possible chemical union of ethylene with the hemoglobin. If such a chemical union takes place under all or certain conditions, the chemical combination of ethylene with the hemoglobin is certainly very unstable; for within fifteen minutes or less patients regain their normal color.

Frequently during operations on the gastro-intestinal tract, strong peristaltic waves have been noted. These do not interfere with the surgical work, although in some cases the peristaltic waves are very marked, the bowel becoming rigid and hard. This is not so frequently encountered during ether anesthesia. After questioning patients on whom abdominal operations have been performed, we are quite convinced that they complain less of gas pains after ethylene than after nitrous oxid anesthesia. Peristalsis is apparently little influenced by ethylene. Absence of interference with peristalsis is a distinct advantage, as regards both gas pains and postoperative ileus. A depressed peristalsis becoming active again may account for the gas pains complained of by some patients when an anesthetic has been employed for operations not involving the abdomen.

The persistence of normal or even exaggerated peristaltic waves during ethylene anesthesia can be accounted for by the removal of the inhibitory control exercised normally by the higher centers through their extrinsic nerves. The persistence of strong peristaltic waves indicates, furthermore, that ethylene does not paralyze or seriously depress the normal neuromuscular apparatus of the bowel responsible for the regular and coordinated propagation of the peristaltic waves. During and after profound or prolonged ether anesthesia, paralysis of the neuromuscular apparatus of the bowel is complete. When the bowel begins to recover, the activity is not coordinated. As a result of this incoordinated activity, local and stationary constrictions of the bowel incarcerate gas; and, by putting the latter under great tension, occasion gas pains. Direct manipulation of stomach and trauma to the intestines will aid in wrecking the normal mechanisms. The effect of stimulating afferent nerves in the abdominal cavity or elsewhere (painful stimuli) leads reflexly to inhibition of gastro-intestinal movements. If morphin is given (for control of pain), another factor is introduced which augments the paresis of the bowel previously brought on by the toxic action of the ether, local injury, or reflex inhibition due to stimulation of sensory nerves.

Ethylene is less toxic in its action on nervous tissue. It is, furthermore, more rapidly eliminated. This accounts for the absence of gas pains except in those few cases in which morphin was given in rather large doses after operation for the control of pain.

3. *Absence of Sweating.*—Absence of sweating is a striking characteristic of ethylene anesthesia. After an anesthesia lasting from forty-five minutes to an hour, the skin is dry. The garments are usually so dry that it is not necessary to change them. This condition of the skin has not been observed with other general anesthetics. No drugs have been given before ethylene is administered, morphin and atropin being dispensed with. The absence of loss of body fluids is a distinct advantage. The dry skin prevents chilling, and should be an important factor in preventing postoperative lung complications.

4. *Absence of Respiratory Irritation.*—In none of the cases which we have observed has there been an increase of saliva or mucus. The mucous membrane of the respiratory tract has not been irritated, and there has been no excessive secretion of mucus. In one case, in which two operations were performed on a patient with pulmonary tuberculosis, there has been no evidence of any extension of the process or irritation of the bronchial mucous membranes. The absence of respiratory secretion and of sweating are distinct advantages which ethylene has over any other general anesthetic agent now employed.

5. *Narrow Anesthetic Margin.*—Patients pass rapidly from the anesthetic to the waking stage; the margin of anesthesia is narrow. This will probably be considered a disadvantage from the point of view of the anesthetist and surgeon, but we think it is a distinct advantage from the point of view of the patient. The narrow anesthetic margin is probably most often noted in abdominal operations. The patient, apparently in deep anesthesia, may gulp suddenly or make some spasmodic movements of the abdominal muscles. The patient can be rendered deeply anesthetic very easily. As experience is gained in the administration of ethylene, a smoother anesthesia will be given. The periods in which patients partially come out from a deep anesthesia are becoming less and less frequent, as experience in administering ethylene is being acquired.

THE DISADVANTAGES OF ETHYLENE

1. *Odor.*—Ethylene gas has not a particularly pleasing odor. A few find it offensive. Others deny any objectionable smell. As with taste, one can say, "De odoribus non est disputandum." Many describe the odor as being similar to "molasses," "sorghum" or "phosphorus matches." It is an exceptional patient who complains about it. After four or five deep inhalations of an 80 per cent. mixture, the odor is no longer noticed, probably because of a depression of the peripheral sense organ or of the olfactory center itself. The odor is certainly no worse than the odor of ether and, unlike ether, this gas is entirely devoid of irritating properties. Many patients on recovering from the anesthesia, state that the gas has no odor. When we first employed ethylene in the operating room, the odor was quite noticeable, but became less and less so until at present it is not noted any more than that of ether. If disagreeable, it could be easily disguised.

2. *Oozing.*—The oozing from the wound is *perhaps* more marked than with other anesthetics. This oozing does not last after the anesthetic has been stopped. There have been no postoperative hematomas. The oozing, while greater, perhaps, is not excessive.

3. *Explosibility.*—As noted in a previous communication, ethylene gas is inflammable. In fact, with certain mixtures with air or oxygen, it is highly explosive. Frankly, this is its weak point and one which should not be dealt with lightly. At that, it is not quite so explosive as ether vapor. Since ether volatilizes from the mask and its volatilization is greatly increased by the patient during expiration and is heavier than ethylene, it would appear that a poorly ventilated room might be charged sooner with an explosive ether-oxygen mixture than with an ethylene-oxygen mixture when only such ethylene escapes into the room as the patient has inhaled. Only careful analysis of the atmosphere in the operating room will reveal whether ethylene or ether is the more dangerous. We certainly advise against the use of the cautery or free flame in the operating room, or any source of electrical discharges. Some preliminary tests have failed to reveal by our method detectable amounts of ethylene in the operating room after one and one-half hours of continuous administration. These tests were made under most favorable circumstances, and will be repeated at an early date, using better methods and analyzing the air in the operating room under more adverse conditions. We write not to alarm but simply to caution those who otherwise might be careless in its use. Knowing that, like illuminating gas and ether vapor, it forms with air and oxygen highly explosive mixtures, it behooves all in the interest of all and everything to be extremely cautious in its administration. On the other hand, we add that ethylene in more or less pure form is used now and has been used for some time for purposes of heating, lighting and welding.

CONCLUSION

In view of our experience, we feel that ethylene-oxygen has a very definite place as a general anesthetic agent, and is deserving of serious consideration and thorough trial.

THE RECORDING OF SCHOOLROOM DATA ON COMMUNICABLE DISEASES

A SIMPLE, GRAPHIC METHOD THAT ADMITS OF A CLOSE EPIDEMIOLOGIC STUDY OF ACTUAL CONDITIONS

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In an effort to study the elusive problem of the spread of communicable diseases in schoolrooms, a plan was devised whereby known cases and known exposures and also cases occurring among exposures after exclusion were noted on a plat representing the seating of a schoolroom. The scope of study included 247 rooms in eighteen, or approximately one fifth of the grade schools. The schools selected represented each geographic subdivision of the Minneapolis school system and an enrolment of nearly 10,000 children. The period of the year chosen for the study was the mid-winter semester beginning Jan. 2 and ending March 16, 1923. As the greatest incidence of communicable diseases occurs in age groups under 10 years, the development of a modified plan applicable to interdepartmental work was not attempted.

The school nurse in each of the schools studied was furnished with a plat for each room of that school, together with instructions (reproduced at the end of this article) for its use. The routine procedure of the division of public health of daily notification to the schools of the report or discovery of cases of communicable diseases was used. On the receipt of this notice in a school included in the study, the nurse made a visit to the room which a child named in the notice was attending, and an inquiry was made of the teacher as to the exact seat occupied by this child. The abbreviation of the name of the disease concerned and the date of onset were then inserted in the space on the plate representing that seat in the schoolroom.

A similar procedure was followed in the case of children excluded as contacts, and the fact of case or contact was differentiated by a symbol. Should the name of a pupil previously excluded as a contact be reported as a case, the fact was noted by symbol together with the date of onset of the contact case. Cases such as pediculosis, which are ordinarily discovered by the nurse, were noted on the plat at the time of discovery and exclusion from school. The date of return to school was also noted on the plat. The routine practice of school nurses to attempt to discover the source of infection, and the lines of transmission of communicable diseases in the schools, were also used in this study. Such information as was obtainable was noted on the plat by connecting with a straight line those cases in which the pupils had a definite school association, such as contiguity of seating during class hours, or friendships involving close association during recess periods. Cases in which the pupils were known to have an association by reason of residence, neighborhood or otherwise, not definitely connected with the school, were shown by a waved, connecting line between the squares representing seats on the plat.

At the end of the semester, the plats from the schools studied were collected and tabulations made, of which Table 1 is representative. It will be noted on examination of this table that 833 children were excluded for all causes; 675 were known cases and 158 were excluded as contacts. Of these contacts, forty-nine developed the disease concerned in their exclusion. They are classed as contact-cases in this study. Had these forty-nine children excluded as contacts who developed cases been permitted to remain in school, the plats of forty-nine rooms would have most likely corresponded to the plat of the room shown of a "missed" case (Fig. 2), rather than the comparative plate shown in which a contact was excluded who developed a case outside the schoolroom (Fig. 1). The incidence of pediculosis and scabies is accounted for by reason of the fact that the schools selected for study were located in neighborhoods having the least social advantages and the greatest amount of congestion in the school buildings.

Table 2 shows the total number of cases and deaths in the city of the four diseases most prevalent during the period of the study. These totals are divided to show percentages of cases and deaths occurring among children in the preschool age; those of over school; those of school age but not attending; those attending private schools, and those attending public schools (Table 2 and Fig. 3).

The foregoing is an attempt to show how a study was made, and the prevalence of certain diseases in the city as the reason why it was undertaken. It is now appropriate to attempt to show any values that may have been derived from these studies.

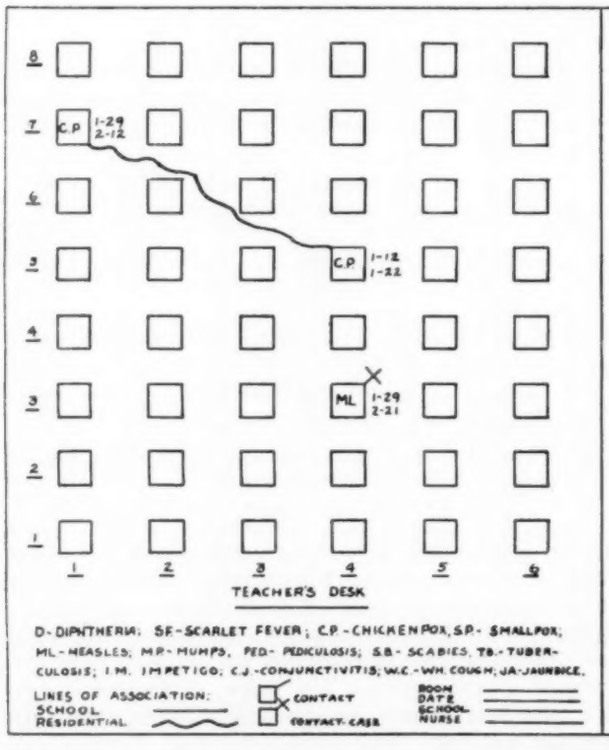

Fig. 1.—A controlled case of measles; also two chickenpox cases with residential association.

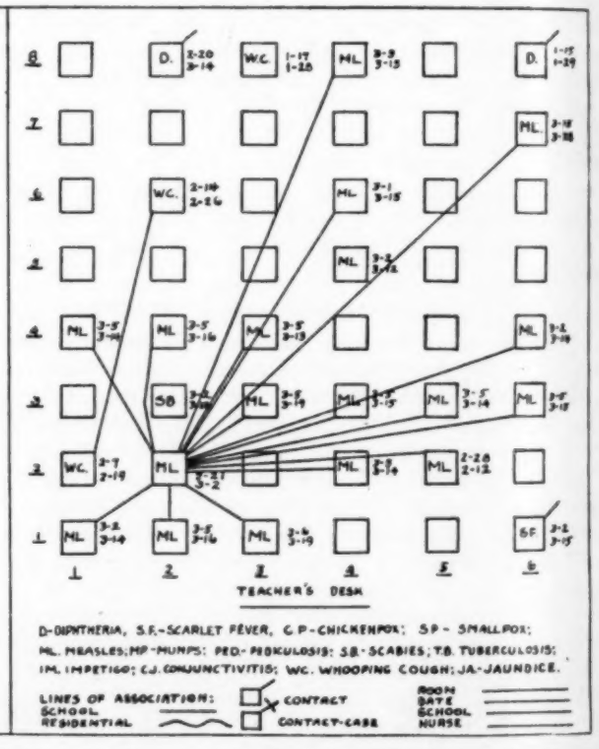
TEACHER'S DESK
D-DIPHTHERIA, S.F.-SCARLET FEVER, C.P.-CHICKENPOX; S.P.-SMALLPOX; ML. MEASLES; MP-MUMPS; PED-PEDICULOSIS; S.B.-SCABIES; T.B. TUBERCULOSIS; IM. IMPETIGO; C.J. CONJUNCTIVITIS; WC. WHOOPING COUGH; JA-JAUNDICE.
LINES OF ASSOCIATION: SCHOOL, RESIDENTIAL
CONTACT
CONTACT-CASE
ROOM
DATE
SCHOOL NURSE

Fig. 2.—A missed case of measles, together with other schoolroom findings.

1. It will be noted that the figures on diphtheria, the knowledge of which affords greater opportunity for preventive work, show a decided contrast to the figures on scarlet fever and chickenpox. These figures also show the imperative need of diphtheria toxin-antitoxin for children in preschool ages. The number of smallpox cases occurring among school children in Minneapolis is still high, though reduced 50 per cent. by a voluntary vaccination campaign conducted during the last three years. In this connection it may be permissible to state that vaccination cannot legally be made a prerequisite to school attendance in Minnesota.

2. The use of a seating plat shows graphically the value of exclusion of cases, contacts and exposures.

3. The seating plat can be used to show data concerning immunization or protection of pupils against communicable disease and facilitate the use of a plan of surrounding unprotected pupils with protected pupils during the prevalence of certain diseases. Those

immunized against diphtheria or smallpox or recovered from measles could be seated nearest to nonimmunes, thus separating the nonimmunes during the hours of school session.

4. The use of a seating plat permits much closer epidemiologic study on means of transmission of diseases in school, and encourages nurses and teachers to give special thought to the possibilities of communicable disease control, as they see children during recreation periods.

5. There is a check on the efficiency of communicable disease regulations, particularly in those cases which are returned as recovered or noninfectious.

6. The responsibility may be fixed for violation of school health rules in case of an epidemic.

7. It affords a graphic means of demonstrating to parents that their children are not being exposed to preventable danger from communicable diseases in school.

8. The tabulation of data gathered on schoolroom plats permits a careful study of communicable disease incidence in schools; a study of the comparative incidence of communicable diseases in schoolrooms of public and private institutions; a comparative study of school incidence as against the total incidence of certain diseases in the city, and the prevalence of certain diseases in certain schools.

9. The record showing residential or schoolroom association as a factor in the transmission of communicable diseases can be kept current during a semester and filed for permanent reference after the semester closes. Cases in this study on which no accurate information could be obtained were shown on the plats without a line of association. If the practice of searching for the course of transmission comes into general use, the accuracy of information obtained is increased, and fewer cases remain on which information is not obtainable.

10. The preliminary work done on this study during a prevalence of diphtheria in October indicated that a theory of "over-the-shoulder" infection from a pupil sitting behind another pupil would be substantiated in those diseases due to direct contact with sprayed nose and throat secretions during coughing, sneezing, singing, speaking or whispering. While the study of the midwinter semester failed to substantiate this theory, it is believed that future studies made during a greater prevalence of certain diseases will establish this means of transmission as a factor worthy of consideration.

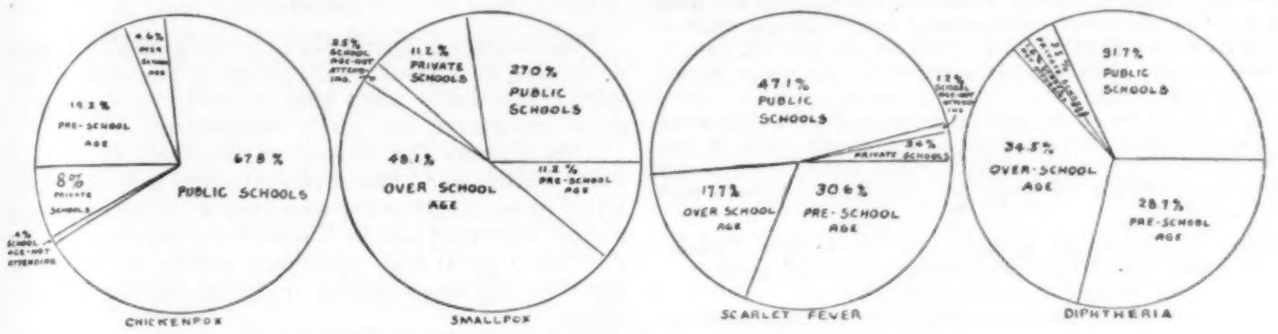

Fig. 3.—Occurrence of chickenpox, smallpox, scarlet fever and diphtheria.

TABLE 1.—*Contagious Diseases in Eighteen Minneapolis Public Schools, from Jan. 2 to March 16, 1923*

School	Diphtheria			Scarlet Fever			Chickenpox			Smallpox			Measles			Mumps			Pediculosis			Scabies			Tuberculosis			Impetigo			Conjunctivitis			Whooping Cough			Ringworm			Jaundice			Totals		
	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case	Case	Contact	Contact Case
1.....	1	4	0	1	0	0	11	5	4	0	0	0	0	0	0	0	0	0	30	0	0	1	0	0	0	0	0	3	0	0	4	0	0	1	0	0	5	0	0	0	0	0	57	9	4
2.....	1	0	0	1	0	0	13	3	4	0	0	0	2	5	0	0	0	0	17	0	0	0	0	0	0	0	0	3	0	0	11	0	0	4	0	0	0	0	0	0	0	0	53	8	4
3.....	1	0	1	1	1	0	2	0	0	1	0	0	1	0	0	2	1	0	3	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	13	4	1
4.....	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	6	0	0	2	0	6	1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	17	0	0
5.....	0	0	0	2	0	0	4	6	1	0	0	0	16	0	0	7	0	0	3	0	0	2	0	0	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0	40	6	1
6.....	4	4	0	1	0	0	2	1	0	0	0	0	0	0	0	5	3	0	19	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	35	8	0
7.....	1	0	0	1	1	0	11	1	0	0	0	0	1	0	0	0	0	0	95	8	6	2	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112	11	7
8.....	0	0	0	2	1	0	5	2	0	0	0	0	1	1	0	4	1	1	95	0	0	3	0	0	1	0	0	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	116	5	1
9.....	2	1	0	10	3	2	2	0	0	0	0	0	29	0	0	4	2	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	55	6	3
10.....	0	0	0	3	3	0	5	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	4	2
11.....	0	0	0	0	2	6	0	0	0	0	0	0	0	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	8	3	9
12.....	3	3	0	1	1	0	0	3	0	0	0	0	0	0	0	4	13	4	14	0	0	3	0	0	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	31	19	4
13.....	0	0	0	2	2	0	10	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	19	3	0
14.....	0	0	0	0	0	0	5	0	1	0	0	0	1	0	0	1	0	0	14	0	0	8	0	0	0	0	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	34	0	1
15.....	0	1	0	0	2	0	0	0	0	3	0	0	0	0	0	0	0	0	15	0	0	11	0	0	0	0	0	3	0	0	0	0	0	9	0	0	0	0	0	0	0	0	39	3	0
16.....	0	0	0	0	1	0	8	5	0	0	0	0	3	2	0	2	1	0	0	0	0	0	0	0	0	0	0	2	0	0	7	0	0	0	0	0	3	0	0	0	0	0	25	0	0
17.....	0	0	0	2	4	0	5	0	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	13	5	1
18.....	0	2	1	0	1	0	0	1	5	0	0	0	0	2	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	6	11
Totals	17	15	2	27	22	8	84	28	18	2	1	0	56	10	4	36	22	9	312	8	6	34	2	1	1	0	0	22	0	0	35	0	0	39	1	1	8	0	0	2	0	0	675	109	49

INSTRUCTIONS TO NURSES

Jan. 2, 1923.

Since the advent of medical inspection in schools, much effort has been applied to the problem of controlling communicable diseases among school children. It has been agreed among health officers that a properly inspected schoolroom is the safest place for a child during the outbreak of an epidemic. It is now proposed to prove this fact as well as to study the epidemiologic factors of diseases that occur among school children, and also with a reasonable accuracy

to determine the spread of infection within the schoolroom, school building and in residential association out of school.

The attached chart represents the seating facilities of a schoolroom. The rows are numbered from left to right and the seats are numbered from the front to the rear of each row. It is expected that the nurse will take the report of communicable diseases which is sent to each school daily and locate the seat used by the pupil who is ill or excluded as a contact. Having learned which seat was used by the pupil in question, the exact corresponding square on the chart is used to insert the abreviation of the disease, and the date of onset or last attendance is inserted in the space to the right of the square.

In order to be of the greatest value, a chart should cover a full semester. Entries should therefore be made in ink, and sufficient care used to avoid errors which would deface the chart. Should the same pupil be "out" on more than one occasion during a semester, an additional square may be placed above the one used on the first occasion. Thus, a pediculosis patient may have smallpox and require a second entry. Contact cases should be indicated by adding a flagellum to the square. Should the one excluded as a contact be reported later as a case, the flagellum should be crossed, and the last date entered below the first date. Care must be used not to connect flagella. [The symbols are given in Figures 1 and 2.]

By lines of association, it is meant that in the cases of pupils out of school for the same disease who were using seats not abutting on each other and who are close companions about the school building, a straight line showing direct exposure in this manner should be used to connect the squares representing their seats in the schoolroom.

By residential association is meant out of school contact between pupils out of school for the same disease who are occupying different apartments of the same building, next door neighbors, neighborhood playmates, etc. This situation should be indicated by a waved line connecting the squares which represent their seats in the schoolroom.

TABLE 2.—*Distribution of Cases and Deaths from Certain Diseases in Minneapolis During the Period from Jan. 2 to March 16, 1923*

		Preschool Age	Over School Age	Of School Age, Not Attending	Private Schools	Public Schools
DIPHTHERIA						
Total cases...	258	28.7%	34.5%	1.6%	3.5%	31.7%
Total deaths.	18	50.0%	11.2%	5.5%	5.5%	27.8%
6.9% of diphtheria cases resulted in death.						
SCARLET FEVER						
Total cases...	467	30.0%	17.7%	1.2%	3.4%	47.1%
Total deaths.	7	57.1%	42.9%			
1.5% of scarlet fever cases resulted in death.						
CHICKENPOX						
Total cases...	870	19.2%	4.0%	0.4%	8.0%	67.8%
No deaths from chickenpox.						
SMALLPOX						
Total cases...	108	11.2%	48.1%	2.5%	11.2%	27.0%
No deaths from smallpox.						

Aldehyd Content of "Moonshine" Liquor.—The chemists of the Internal Revenue Laboratory who have made thousands of analyses of aged in the wood whiskies prior to prohibition now note that samples which come into the laboratory in connection with raids on "moonshine" sugar, grain or fruit distilleries usually show a high content of acetaldehyd. The "ranker" the liquor, the higher the aldehyd content. The reason is, of course, apparent. The impossibility of fermentation control by the moonshiner results in a considerable oxidation of the ethyl alcohol into acetaldehyd and even acetic acid. The simple pot still and the eagerness for more profits in not discarding heads and tails did the rest, and the liquor presented to the trustful purchaser had everything that is needed to deliver a complete knockout.—J. M. Doran and G. F. Beyer: *Am. J. Pub. Health* **13**:831 (Oct.) 1923.

COMPRESSION FRACTURE OF THE SPINE DEVELOPING DELAYED SYMPTOMS

(POST-TRAUMATIC SPONDYLITIS, OR KÜMMELL'S DISEASE)*

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Post-traumatic spondylitis, or Kümmell's disease, developing as a result of compression fractures of the spine, particularly when seen in young children, is of great importance and rarely encountered.

That Kümmell's[1] disease as described in 1895 is now regarded as a distinct clinical entity is firmly established by most authorities who have written on this type of bone affection, and to Kümmell we are indebted for the first clinical and pathologic report, in which he describes six cases coming under his personal observation.

Post-traumatic spinal deformities developing after from two to six months, or even several years following the original injury, have been too frequently overlooked, or have had the vague and simple caption of back strains, arthritis, contusions, sprains, curvature of the spine or localized neuroses applied to them.

It is to emphasize the great importance of a thorough clinical observation in these cases of vertebral injury without cord lesions, together with a complete neurologic and roentgenographic examination that I am prompted to record a typical case of post-traumatic spondylitis, which has recently come under my care.

The essential predisposing cause is traumatism, whether the trauma to the spine is direct or indirect. In many instances the local tenderness or sensitiveness or pain over the injured portion of the vertebra is frequently very mild and may or may not disappear in a few days. Kümmell states that three distinct stages can be recognized in these cases: (1) the stage of initial injury to the spinal column, attended with a varying degree of surgical shock; (2) the stage of "relative well-being," in which the patient is able to attend to his duties and carry on his occupation, and (3) the development of the third stage, in which, after several weeks, months or even two or three years have elapsed, an angular kyphose appears, and with it the resumption of pain, both local over the spine, or radiating down the extremities, or of a neuralgic character, which frequently is very severe and requires for a time complete rest in the recumbent position.

As Kümmell's disease is essentially not fatal, the pathologic reports and the description of the gross and microscopic findings recorded in the literature in these cases are very meager.

Ludloff, at the Dresden Orthopedic Congress held in May, 1920, demonstrated a specimen of the lumbar spine obtained post mortem. Following traumatism in which no compression fracture was demonstrated, there was found at necropsy distinct contusion and rupture of the blood vessels of the lumbar segments; and, as a result of this nutritional impairment, necrosis involving the spongiotrabeculae of the affected segments was shown which resulted in a compression of the anterior portion of the lumbar bodies and the formation of an angular kyphosis.

* Read before the Section on Orthopedic Surgery at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

1. Kümmell: Deutsch. med. Wchnschr., 1895, No. 2, p. 180.

It is important to remember that compression fractures of the vertebra, irrespective of the location of the fractured segment, occur in many instances without cord lesions, and that because paralysis does not exist, we should not disregard the possibility of a spinal fracture. The frequency of spinal fracture in the different areas of the column is best shown diagrammatically (Fig. 1). It must also be borne in mind that, in these cases of traumatic spondylitis, a compression fracture does not always exist, and that, as pointed out by Kümmell, the original traumatism to the spine resulting in a contusion of the spongiosa of the bodies of the vertebrae is sufficient to produce atrophy of the bony framework resulting in a slow and gradual compression of the segments involved.

Roentgenographic examination should invariably be made in every case of spinal injury, and an anteroposterior as well as a lateral view is essential. However, as pointed out by several contributors to the subject of post-traumatic spondylitis, the early roentgenograms may not show any demonstrable lesion, whereas after months or even several years, the collapse of the vertebral bodies and the compression of the intervertebral disks is clearly seen by the roentgenogram as the case advances. Mauclaire and Burnier,[2] emphasizing the relative frequency of delayed traumatic vertebral deformities, state that "even in comparatively slight injuries of the vertebral column they should be interpreted and treated as spinal fractures in all doubtful cases."

The differential diagnosis from tuberculous caries (Pott's disease), neuroses, contusions, ankylosing spondylitis, back sprain, and the not infrequent hysterical spinal manifestations or so-called railway spine, demand most careful and thorough consideration, both from a clinical and a roentgenographic standpoint. The prognosis is, as a rule, favorable, provided early treatment is instituted; and, although the deformity when once established cannot be reduced, nevertheless the increase in the size of the kyphos can be controlled by the wearing of a suitable immobilizing apparatus or snug fitting plaster-of-Paris jacket, and ankylosis either fibrous or bony may be obtained which will give functionally an excellent result. In the more severe types of the disease, particularly in the neglected cases, a radical ankylosing operation, such as described by Hibbs or Albee in the treatment of spinal tuberculous caries, should be advised.

REVIEW OF THE LITERATURE

Kümmell[1] reported a series of six cases of post-traumatic spondylitis in 1895, which at that time he believed to be a progressive osteoporosis following traumatism of the vertebral column.

The first case observed by him occurred in a man, aged 22, who jumped from a moving train to the station platform. The upper portion of the spinal column was violently pulled backward, but he did not fall. Immediately following the accident he suffered severely with pain in the back, which necessitated his remaining in bed for a few days, but he was then able to resume his work as a salesman. Six months later severe pain, localized over the traumatized area of the spine and also radiating down both extremities, required his obtaining surgical aid. On examination, the patient presented the typical clinical appearance of spondylitis with a well marked and angular deformity of the eighth and ninth thoracic vertebrae. Horizontal fixation and rest in bed for a short period gave prompt relief from the pain, and the wearing of a plaster-of-Paris corset resulted in a complete arrest of the disease, but with a permanent kyphosis of the spine in the affected dorsal region. The functional result was excellent, and he was able to resume his work without discomfort, wearing for several months a supporting apparatus. Five other cases occurring in young adults were included in the original report; all of the patients made a satisfactory recovery, but with a permanent deformity of the spine.

Grawitz[3] refers to these cases as benign spondylitis following traumatism, and records two cases which were under his personal observation. In one of these, which occurred in a man, aged 22, a partial paraplegia developed shortly after the accident, but with rest in the horizontal position and complete fixation of the column, the paralysis disappeared; but a gibbosity of the seventh to the ninth dorsal vertebrae remained.

In the same year, Kaufmann[4] added one case to the literature. He believed that in all cases a vertebral fracture exists, and he suggested the term "secondary traumatic kyphosis" to be applied to this type of spinal injuries.

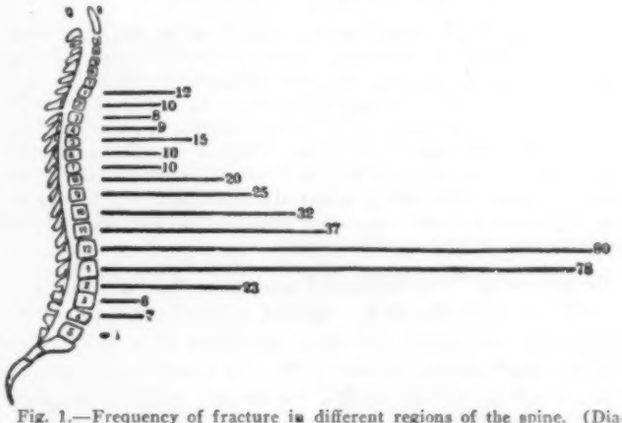

Fig. 1.—Frequency of fracture in different regions of the spine. (Diagram from Clinics of John B. Murphy; reproduced from article by Dr. J. Warren Sever, Surg., Gynec. & Obst. **22**: 338 [March] 1916.)

Kirmisson[5] reported two cases of vertebral deformities due to unrecognized spinal compression fracture occurring in persons aged, respectively, 18 and 11 years:

A boy, aged 18, sustained an injury to the spine by falling from a tree a distance of 15 feet; he struck on his back, and shortly after the accident there was a swelling localized over the lower dorsal area. After a month's rest and subsidence of the local swelling he returned to his work, but in the course of two months the acute pain returned, and the development of an angular deformity of the twelfth dorsal and first lumbar segments established the diagnosis of compression fracture with delayed spinal symptoms.

A boy, aged 11, fell from a grain stack but was able to walk immediately after the injury; in two weeks, however, a distinct deformity of the seventh, eight and ninth dorsal vertebrae developed, with a marked compensatory lordosis.

In 1896, Henle[6] contributed a series of four cases occurring in young adults.

In the first case, a man, aged 35, stepped on the ice and fell backward, striking on his back, and experiencing a severe pain in the middorsal region of the spine. The localized pain subsided in a few days, but shortly afterward returned with increasing severity. Rest in the dorsal position gave him relief from the pain, but on the slightest movement of the

2. Mauclaire and Burnier: Arch. gén. de chir. **6**: 274, 1912.

3. Grawitz: Charité-Annalen **20**: 169, 1895.
4. Kaufmann: Monatsschr. f. Unfallheilk., 1895, No. 6, p. 169.
5. Kirmisson: Rev. d'orthop. **7**: 481, 1896.
6. Henle: Arch. f. klin. Chir. **52**: 1, 1896.

spine the pain returned, referred not only to the spine but also to the abdomen and lower extremities. Immobilization in a plaster-of-Paris corset apparently gave no relief, and in seven months a small, angular kyphos was noticed in the dorsal region, with its apex at the tenth segment. This deformity was only slightly tender on pressure, but when the patient assumed the standing or sitting position, and when making pressure on the head, the pain was severe and always localized over the traumatized area. After several months of complete fixation in plaster-of-Paris jackets he was able to resume his occupation as an engineer.

This case was of particular interest because the early diagnosis when first observed was considered to be one of neurasthenia. This case emphasizes the fact that even in comparatively slight injuries traumatic spondylitis can develop.

Staffel [7] and Kirsch,[8] in 1897, each reported one case of Kümmell's disease in young persons coming under their care. In the same year one case was added to the literature by Vulpius.[9]

Schneller's [10] case is of particular interest:

A man, aged 43, while loading wood on a carriage, suddenly experienced a very severe pain in the back while lifting a heavy piece of lumber. He was obliged to remain in bed for several days; after a number of weeks he noticed improvement both as to the absence of severe pain and in his ability to walk with the aid of a cane. Fifteen months after the original injury, a well marked kyphosis appeared in the midthoracic spine, with the gradual disappearance of the pain. The diagnosis of post-traumatic spondylitis, due to indirect violence, was definitely determined.

Godonneche [11] contributed one case to this subject in 1897, and Heidenhain [12] added eleven cases, in all of which the secondary changes occurred soon after the original traumatism to the spine. In one of these cases a tuberculous spinal caries, secondary to the original vertebral fracture, occurred.

Wagner and Stolper's [13] report, published in 1898, is of unusual importance, for in the cases observed by them, no vertebral fracture was demonstrated, although both patients presented the true type of traumatic spondylitis, involving the lumbar segments.

Transitory paraplegia was present in the case recorded by Froelich [14] in 1898; and in Hattemer's [15] cases, in addition to the secondary traumatic kyphosis, there was present also a dislocation of the compressed vertebral segments.

Woerner [16] added seven cases to the literature on this subject. In his opinion, the diagnosis of traumatic spondylitis is not dependent entirely on the formation of a gibbus, although this deformity is usually present. Scoliosis is frequently present and can be easily demonstrated by roentgenography. In many instances the angular deformity can be prevented if the cases are early recognized and suitable immobilizing apparatus is applied.

The youngest case of Kümmell's disease recorded up to the year 1900 was reported by Hergens [17] in a child, aged 8, who, following a fall, complained of backache. Four days later, an angular deformity of the sixth dorsal vertebra was seen which was painful on pressure and increased in size, although an immobilizing corset was applied shortly after the accident.

Golebiewski's [18] case of healed compression fracture of the eleventh and twelfth dorsal vertebrae was complicated by an injury of the spinal cord, and occurred in a laborer, aged 28, who fell from a wall a distance of about 20 feet. Following the accident and owing to the compression of the bodies of the vertebrae, the patient's height was diminished about 4 cm.

Ruland [19] contributed seven cases, reported in 1900. The youngest case in his series occurred in a 16-year-old boy.

Bonsdorff [20] contributed two cases coming under his observation. He called attention to the extreme importance of careful examination of these cases in accident insurance practice.

Three cases were reported by Wegner [21] in 1901, and in the same year Krueger [22] contributed one case of traumatic spondylitis caused by a forcible rotation of the spine, resulting in a marked scoliosis and the development of an angular deformity of the third and fourth lumbar vertebrae.

In 1903, Brehmer [23] added one case, and in the same year Brodnitz [24] stated that the roentgenographic findings in the case observed by him showed no abnormal vertebral change at the time of the accident or even as late as eight months after the injury, although, clinically, four months following the accident a distinct angular gibbus appeared at the first lumbar vertebra.

Reuter [25] speaks of the pathologic changes in a case of "spondylitis traumatica," in which there was seen, at postmortem, rupture of the spinal ligaments, luxation of the bony trabeculae and extensive hemorrhage into the bony cellular tissue, and compression of the vertebral bodies.

In Beduschi and Bossi's [26] case, paralysis of the right leg, with involvement of the bladder and rectum occurred; under treatment, it gradually disappeared.

In Chappatt's [27] series of seven cases, the youngest case was in a lad of 12 who fell from a tree a distance of about 10 meters; after a fortnight, lumbar pains developed, and the formation of an angular kyphosis of the twelfth dorsal and first lumbar vertebra occurred.

Grisel,[28] in 1907, laid emphasis on the difficulties that may arise in differentiating tuberculous caries from traumatic deformities of the spine of the Kümmell type.

Petersen [29] laid stress on the differentiation between Pott's disease, preceded by trauma, and traumatic spondylitis with delayed gibbus formation.

Guillain and Laroche [30] contributed one case in 1908, and Markus [31] reported one case in which, in addition to the angular kyphosis, there was a slight S shaped spinal scoliosis.

In 1909, Brauer [32] published the report of two cases of Kümmell's disease involving the cervical spine.

7. Staffel: Monatsschr. f. Unfallheilk., 1897, No. 7, p. 204.
8. Kirsch: Monatsschr. f. Unfallheilk. **4**: 140, 1897.
9. Vulpius: Monatsschr. f. Unfallheilk. **4**: 201, 1897.
10. Schneller: München. med. Wchnschr., 1897, No. 2, p. 39.
11. Godonneche: Thèse de Paris, 1897.
12. Heidenhain: Experiences with Traumatic Spondylitis, Monatsschr. f. Unfallheilk. **4**: 65, 1897.
13. Wagner and Stolper: Deutsch. Chir. **40**: 244, 1898.
14. Froelich: Rev. médicale de l'est. **30**: 284, 1898.
15. Hattemer: Beitr. z. klin. Chir. **20**: 103, 1898.
16. Woerner: Fortschr. a. d. Geb. d. Röntgenstrahlen **2**: 83, 1899.
17. Hergens: Inaug. Diss., Leipzig, 1900.
18. Golebiewski: Lehmann's Handaltanten **10**: 158, 1900.
19. Ruland: Inaug. Diss., Bonn, 1900.
20. Bonsdorff: Traumatic Kyphosis with Gibbus Formation, Finska läk-sällsk. Handl. **42**: 191, 1900.
21. Wegner: Deutsch. militärarztl. Ztschr. **30**: 157, 1901.
22. Krueger: Tr. Gesellschaft für Natur, und Heilkunde zur Dresden, 1901; München. med. Wchnschr., 1902, No. 10, p. 421.
23. Brehmer: Inaug. Diss., Greifswald, 1903.
24. Brodnitz: Centralbl. f. Chir. **30**: 902, 1903; Tr. II Congress of German Society for Orthopedic Surgery, June, 1903.
25. Reuter: Arch. f. Orthop. **2**: 137, 1904.
26. Beduschi and Bossi: Arch. di Orthop. **21**: 353, 1904.
27. Chappatt: Thèse de Nancy, 1906.
28. Grisel: Rev. d'orthop. **8**: 167, 1907.
29. Petersen: Inaug. Diss., Berlin, 1907.
30. Guillain and Laroche: Bull. et mém. Soc. méd. d. hôp. de Paris, 1908, p. 516.
31. Markus: Aerztliche Sachverständigen Zeitung, 1908, No. 22.
32. Brauer: München. med. Wchnschr., 1909, No. 8, p. 425.

Redard,[33] in his lecture delivered at the Second International Medical "Accident Congress" in 1909, reported two cases of industrial accidents resulting in injuries of the vertebral column, and mentioned three cases that came under his treatment. The roentgenographic findings in all of his cases showed a collapse or compression of the affected vertebrae. He recognized as a true type the post-traumatic vertebral deformities, described by Kümmell, but added that this type must be distinguished from the remote vertebral deformities which follow true compression fractures of the vertebrae and which are characterized by pronounced gibbus formation or a lateral deviation of the vertebral column.

Maingot[34] added one case to the literature in 1910; two cases were recorded by Schanz[35] in the same year.

That traumatic spondylitis occurs in very young children was observed by Temkin[36] in 1910, reporting a case of a child who at the age of 10 years had fallen backward from a ladder, a distance of 1.5 meters, injuring the spine. Eighteen months after the accident there was a distinct scoliosis and a lateral compression of the body of the fourth lumbar segment.

In 1911, Schulz[37] reported twenty-one typical cases of traumatic spondylitis which came under his observation at the Hamburg-Eppendorf General Hospital. In this series he stated that the original injury to the spine was, in the majority of cases, relatively slight. Schulz referred to the medicolegal aspect, which sometimes may be encountered, and reported one case in a man, aged 35, who fell from a high scaffolding, sustaining a vertebral fracture, in which the angular deformity of the spine did not develop until several months after the original trauma, when there appeared a definite Kümmell kyphosis.

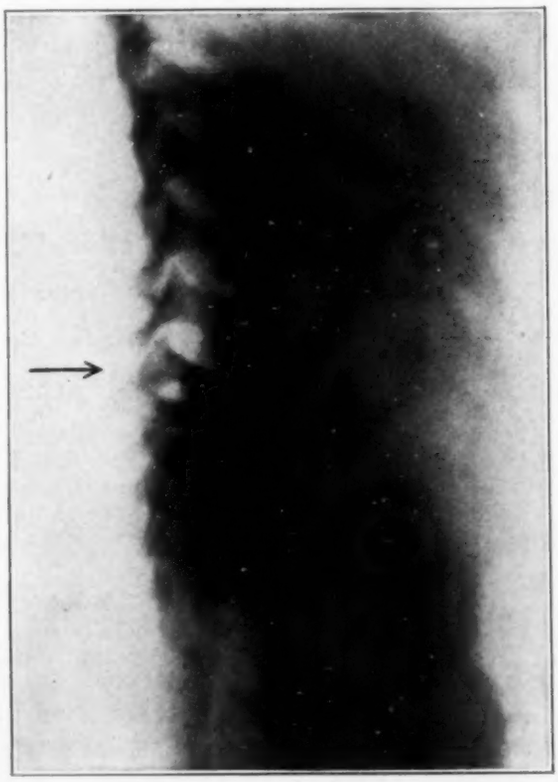

Fig. 2.—Lateral view of lumbar region of spine, Oct. 2, 1922, showing marked compression fracture of fourth lumbar segment, with thinning and compression of intervertebral disks and angular deformity of fourth and fifth lumbar vertebrae.

In 1911, Imbert and Vial[38] mentioned the fact that one year after Kümmell's original report, Verneuil contributed one case, which he demonstrated before the Paris Medical Academy. This case was of particular interest, for the original diagnosis was considered to be rheumatism, affecting the abdominal viscera and the abdominal muscles, although a previous history of extreme muscular effort on the part of the patient in trying to avoid falling on the ice had been elicited. Four months after this injury, a slight angular kyphosis appeared at the ninth dorsal vertebra.

Verneuil[39] mentioned those obscure cases of vertebral fracture which are caused by violent muscular contractions and are frequently unrecognized, in which a very common symptom is that of girdle or neuralgic pains in the thoracic region, with a delayed gibbus deformity. He reported two cases, illustrative of this type of spinal accident.

De Anna[40] added two cases to the literature occurring in middle aged adults, and Achard and Flandin,[41] one case.

Mauclaire and Burnier[42] described two cases of Kümmell's disease which was previously known of by the French surgeons as "insidious vertebral fractures." In one of their cases a scoliotic lumbar curvature, due to a right lateral displacement at the level of the third lumbar segment and a compression of the lumbar body and flattening of the intervertebral disks, was shown by roentgenographic examination. These writers believe that the prognosis is favorable in Kümmell's disease provided early treatment is instituted and proper supporting apparatus applied.

In Mallin's[43] case, reported in 1913, the angular deformity did not develop until eighteen months after the spinal injury.

Ewald[44] stated that, in the case observed by him, pain in the traumatized area of the spine did not appear until nine months after the accident, and was coincident with the appearance of a spinal deformity. Roentgenographic examination showed a well defined vertebral fracture.

Balthazard,[45] in 1914, described a case of traumatic spondylitis, which resulted in the death of the patient six months after the accident. The necropsy findings showed a marked spinal scoliosis, with a compression fracture of the anterior portion of the body of the eleventh dorsal vertebra, while the posterior part of this segment was intact, owing to extreme forward flexion of the spine at the time of the injury. In addition to the vertebral compression fracture there was a rupture of the transverse processes, but the articular processes were not fractured. He believes that the exact pathogenesis of this disease is still theoretical, and that in many cases no vertebral fracture can be demonstrated. This is the first complete report of the postmortem findings recorded in the surgical annals on this subject.

33. Redard: Ztschr. f. orthop. Chir. **24**: 80, 1909.
34. Maingot: Tr. Soc. de radiol. méd. de Paris, 1910, p. 244.
35. Schanz: Jahresb. d. Ges. f. Natur. und Heilk., 1910.
36. Temkin: Thèse de Paris, 1910.
37. Schulz: Beitr. z. klin. Chir. **27**: 363, 1911.
38. Imbert and Vial: Presse méd. **19**: 561, 1911.
39. Verneuil: Bull. de l'Acad. de méd., 1892, No. 39, p. 496.
40. De Anna: Inaug. Diss., Berlin, 1911.
41. Achard and Flandin: Gaz. d. hôp. **84**: 862, 1911.
42. Mauclaire and Burnier: Arch. gén. de chir. **6**: 274, 1912.
43. Mallin: Hospitalstid. **6**: 105, 1913.
44. Ewald: Med. Klin. **10**: 886, 1914.
45. Balthazard: Rev. de chir. **19**: 276, 1914.

Frazier [46] records the case of a man, aged 42, who came under his supervision. He points out the difficulties that may arise in clinically differentiating these cases from such spinal conditions as hypertrophic arthritis, the ankylosing forms of spondylitis, and the hysterotraumatic injuries of the vertebral column.

Glaser [47] contributes one case:

A man, aged 55, met with a severe accident by being thrown from his bicycle, striking his head and neck violently against the ground. The diagnosis arrived at immediately following the injury was a cerebral concussion. Five years after the original trauma he was admitted to the hospital, complaining chiefly of pain in the cervical spine. This pain was very severe and was referred to the neck and shoulders, extending over the entire skull. Extreme pain and tenderness was elicited on pressure over the cervical spine from the first to

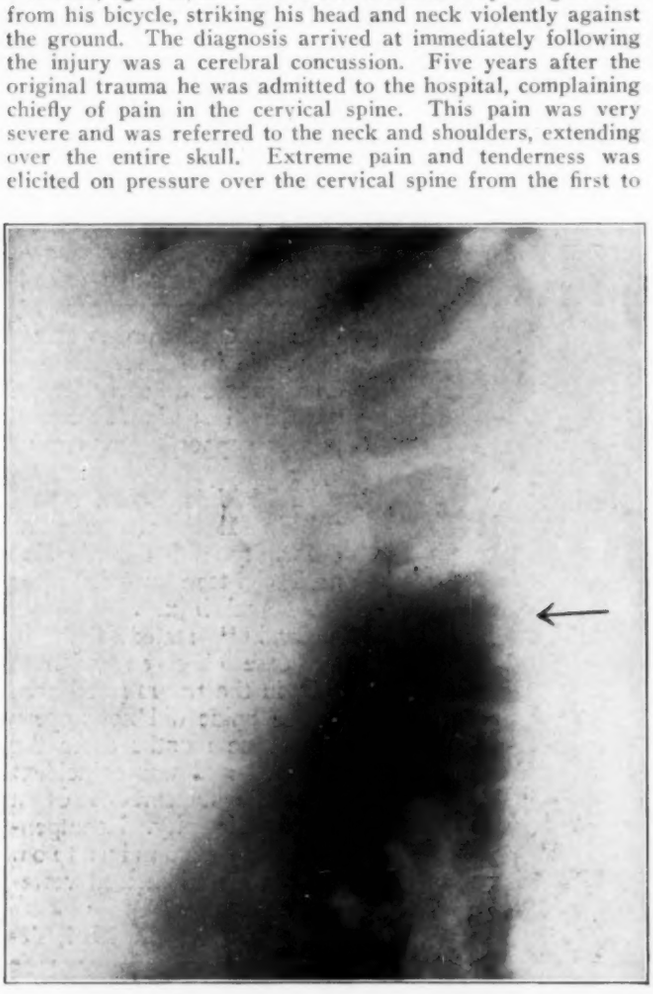

Fig. 3.—Lateral view of lumbar region of spine, March 24, 1923, showing marked compression fracture of fourth lumbar segment, with thinning and compression of intervertebral disks and angular deformity of fourth and fifth lumbar vertebrae.

the fourth segments. The Wassermann reaction was positive, and intravenous injections of neo-arsphenamin were administered, which gave no improvement. Death resulted suddenly.

The necropsy findings showed the cervical vertebrae from the first to the fourth to be roughened, and from this roughened area exuded a yellowish purulent fluid. The vertebral bodies were eroded, roughened and necrotic. The spinous and transverse processes were also necrosed. The microscopic findings showed a chronic inflammatory process, with the formation of fibrous masses and atrophy of the spongiosa of the bone. No syphilitic or tuberculous changes were seen.

This case is of particular importance, owing to the fact that the necropsy findings and microscopic examinations were carried out in detail, and also that the stage of "relative well being" lasted for nearly six and one-half years following the accident. The patient during this stage compained only of vertebral rigidity, confined largely to the cervical spine.

Braun [48] contributed one case in 1919, and Duschak [49] reported one in which he stated that the roentgenographic examination was negative following the injury, and that no compression fracture of the affected vertebrae could be seen.

Ferrannini [50] reports one case, which he considers typical of Kümmell's disease, that presented compression of the vertebral bodies and the formation of a double kyphosis of the lumbar spine.

In 1920, Baker [51] added to the literature a compilation of seven cases of Kümmell's syndrome. In his conclusions, he stated that a compression fracture of the spinal bodies is frequently not diagnosed or is incorrectly diagnosed at the time of the original injury, and that the clinical symptoms may not appear until long after the vertebral trauma. The prognosis depends on the early diagnosis and the institution of proper treatment.

In 1921, Gorsch [52] gave the clinical history and roentgenographic findings of a case of compression fracture of the first lumbar vertebra with delayed symptoms, occurring in a man, aged 56, in whom the roentgenograms taken shortly after the injury showed no vertebral fracture. The crushing or compression of the first lumbar body was clearly revealed, however, three months after the accident, as was also the development of the angular kyphosis. He adds that "in Kümmell's disease there are none of the usual signs of spinal fracture present."

In 1921, Kümmell [53] contributed a second article on the subject of post-traumatic spondylitis. He states that since his original publication there have been many misunderstandings of the exact nature of the disease; and he again clearly outlines the clinical picture presented in this type of bone injury. He quotes the experimental work of Lange, who has definitely shown that the vertebral bodies break down or become compressed after a certain amount of weighting pressure is exerted on them, but that this collapse is preceded by very definite processes. First, the weighting pressure produces no demonstrable changes in the vertebral spinal segments until a certain pressure has been exceeded, and when this limit is reached the bodies become compressed according to the weight exerted on them; and, with the removal of this weighting, they either resume their original shape and configuration, or become permanently collapsed. It is natural to assume that with this compression the delicate bony framework will be damaged or destroyed and infiltrated with blood.

His conclusion, therefore, is that in some cases of traumatic spondylitis a compression vertebral fracture does not exist, but that a forcible traumatism to the spongiosa of the bodies of the vertebra suffices for the gradual production of atrophy of the bony framework and the slow compression and collapse of the vertebral body. Roentgenographic examination of these cases a short time after the injury shows no abnormal findings, but after months or even years elapse there is seen by

46. Frazier: Treatise on Surgery of the Spine and Spinal Cord, 1918; Traumatic Spondylitis, p. 449.
47. Glaser: Med. Klin., 1918, No. 15, p. 360.
48. Braun: Handbuch der Unfall-Medizin **1**: 545, 1919.
49. Duschak: Wien. klin. Wchnschr. **30**: 1599, 1920.
50. Ferrannini: Stud. Riv. di Sc. Med. **11**: 41, 1921.
51. Baker, R. H.: Surg., Gynec. & Obst. **31**: 359 (Oct.) 1920.
52. Gorsch: Ann. Surg. **73**: 360 (March) 1921.
53. Kümmell: Arch. f. klin. Chir. **118**: 876, 1921.

roentgenograms a collapse of the body of the vertebra and the compression also of the intervertebral disks.

He states that it is probably not correct to consider a "rarefying osteitis" following traumatism to the spine as the origin of the disease, but that this cause must be sought in the most "variegated gradations" as a result of the spinal injury, of which a compression fracture is one but not the only contributing factor. In the mildest type there may be only a slight contusion of the spongiosa of the body of the vertebra, with hemorrhagic infiltration and periosteal thickening. Kümmell lays stress on the fact that the characteristic feature in this symptom complex is that the primary traumatism presents no clinically demonstrable lesions, and distinct clinical symptoms develop after months or years following the original trauma.

REPORT OF AUTHOR'S CASE

History.—A boy, aged 9 years, who was born in Illinois, and who had resided in Colorado for the past fourteen months, was one of fifteen children, six of whom were living. The father was living and in good health with the exception of having occasional attacks of bronchial asthma. The mother was living and was supposed to have had pulmonary tuberculosis and was sent to Colorado. The clinical and roentgenographic examination made of the mother on a recent date showed no evidence of a pulmonary tuberculous lesion. The child had had measles and diphtheria in early life. With the exception of these illnesses he had always been a healthy, robust boy up to the time of his sustaining a spinal injury.

In August, 1918, when 5 years of age, he fell over a heavy iron wash tub, striking the lower portion of the spine against the tub and a cement floor.

Immediately following the accident he was unconscious for five or ten minutes, and on regaining consciousness he complained of severe pain in the back and thighs. The skin over the traumatized area showed no abrasion, and there was no ecchymosis. There was no involvement of the bladder or rectum. He was kept in bed for two days, and with the complete subsidence of the pain he was allowed to be up and about, and was able to play like other children. One week after this injury a swelling of the soft parts over the lumbar area was seen, which disappeared in a few days with the use of hot compresses.

Two months after the accident he complained of severe pain in the lower portion of the back, radiating down the anterior and median aspects of the thighs to the knees. Motion of the spine, particularly in forward bending, elicited great pain, which was more severe at night. There was no abdominal discomfort, and the bladder and rectum were not involved. There was no evidence of paralysis of the lower extremities. At this time an angular deformity was noticed by the mother, situated in the region of the lower lumbar vertebra, which was painful on pressure. Rest in bed in the horizontal position for a period of about two weeks gradually gave relief from the pain, both local over the spine and from the referred pain down the thighs. The permanent angular kyphosis remained.

On account of the increase in the size of the kyphosis, the child was brought to Dr. Hart of Denver for examination, who referred the case to me.

The first roentgenograms taken by Dr. Hart showed no evidence of tuberculous caries, but the lateral view of the lumbar spine demonstrated a compression spinal fracture of the fourth segment, and thinning of the intervertebral disks between the fourth and fifth lumbar vertebrae.

Examination.—Oct. 22, 1922, the boy was moderately well nourished, and walked without the support of apparatus, with no evidence of a limp. The left scapula was more prominent than the right.

There was an angular kyphosis involving the fourth and fifth lumbar segments, with slight pain on pressure over the spinous process of the fourth segment. There was no infiltration over the gibbosity and no evidence of psoas spasm. There was no deviation laterally of the spinous processes.

Motion of the vertebral column above the deformity was normal in flexion and on lateral or twisting movements of the spine. Hyperextension of the lumbar spine was restricted, but no pain was experienced in any motion of the column.

There were no motor or sensory disturbances in the back or lower extremities. Motion of the hip joints was normal.

The knee jerks and Achilles reflexes were normal, and there was no evidence of cauda equina involvement and no incontinence of the bladder or rectum. The heart, lungs and abdomen were normal.

The neurologic examination, made by Dr. C. S. Bluemel, showed no evidence of spasticity of the upper or lower extremities, and the gait was normal. There were no sensory disturbances of the abdomen, lower extremities or perineum. There was no ankle clonus, and Romberg's symptom was not present. There were no Gordon, Babinski or Oppenheim reflexes. The abdominal and cremasteric reflexes were normal.

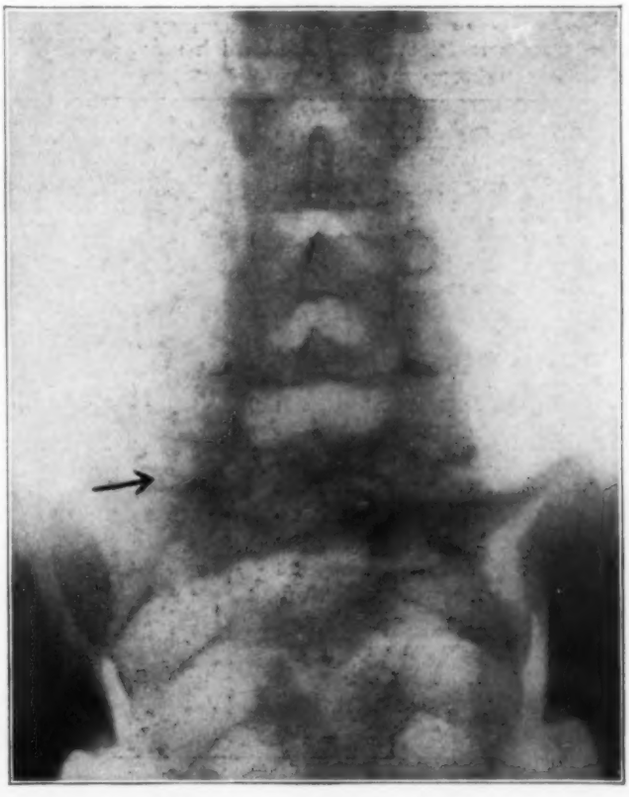

Fig. 4.—Anteroposterior view of lumbar region of spine, March 24, 1923, showing marked compression of intervertebral disk between fourth and fifth lumbar segments. The spinous processes are not fractured, and there is no lateral deviation of the lumbar column.

The pupils were large but otherwise negative. The eye grounds were normal. The skin was dry and slightly roughened. The result of the neurologic examination showed no cord or cauda equina or posterior spinal nerve root disturbances, and with the exception of the angular deformity the spine was negative.

The urine examination was negative, and the Pirquet skin reaction and the complement fixation test for tuberculosis were negative. The complete complement fixation test showed 100 per cent. hemolysis with all antigens. The blood Wassermann reaction was negative.

The second series of roentgenograms, taken in October 1922, and again in March, 1923, by Dr. S. B. Childs, showed no evidence of tuberculous caries of the spine.

Figures 2 and 3 are lateral views of the lumbar spine and sacroiliac joints. The spacing between the fourth and fifth lumbar vertebrae is partially obliterated, but there is no lateral deviation of the lumbar column. The spinous processes are not fractured.

In figure 4, an anteroposterior view, the lumbar spine shows a marked compression fracture of the fourth lumbar segment

and thinning and compression of the intervertebral disks. The posterior angulation is seen involving the fourth and fifth lumbar vertebrae.

The lateral (Fig. 5) and posterior (Fig. 6) photographic views show the well marked angular kyphosis of the fourth and fifth lumbar segments, caused by the compression fracture in this region.

The clinical diagnosis at the time of the first examination and confirmed by repeated roentgenograms, taken several weeks apart, was that of post-traumatic spondylitis, or Kümmel's disease, having as the etiologic factor a compression spinal fracture of the fourth lumbar vertebrae.

Treatment and Results.—The treatment instituted at the time of the first examination was the application of a plaster-of-Paris jacket with the patient in the horizontal position. These jackets were removed and reapplied at frequent intervals in order that the case could be most thoroughly examined and any increasing deformity noted. As there has been no increase in the size of the kyphosis since the patient came under my care, it was not deemed necessary to perform an ankylosing spinal operation. The child is now up, and complains of no pain or discomfort but continues to wear a snug fitting plaster-of-Paris jacket to prevent further deformity.

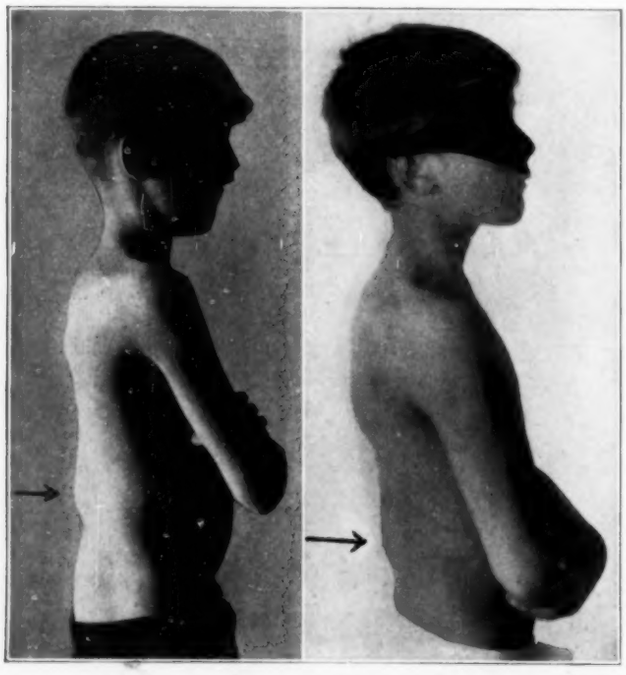

Fig. 5.—Marked angular deformity as seen from the lateral view.

In the review of the literature of the reported cases we find but five cases in which this symptom complex has occurred in young children. Kirmisson reports a case occurring in a boy, aged 11. In Hergen's report the child was but 8 years old. In Chappatt's and in Petersen's cases the children were 12 years of age, and in the clinical record of Temkin, the child observed by him was but 10 years of age. So far as can be ascertained, therefore, the patient who came under my care is the youngest child in whom the disease has been observed, having sustained the original spinal injury when 5 years old, which resulted in a compression spinal fracture with delayed symptoms, with a permanent angular kyphosis of the fourth lumbar vertebra.

CONCLUSIONS

1. Kümmell's disease is a distinct clinical entity, having as its basic origin a traumatism to the spine, which may be mild or severe.

2. This traumatism, resulting in post-traumatic spondylitis, may be caused by a direct or indirect injury to the vertebral column.

3. There are three distinct and frequently clearly outlined clinical stages of the disease, resulting in a permanent angular spinal deformity.

4. Compression fractures are not always present, but in some instances severe contusions of the spongiosa of the vertebral segments is sufficient to produce damage to the bony framework and the slow and gradual collapse of the spinal segments.

5. The roentgenographic findings show no demonstrable bony change immediately after the injury, but after several months or even years a collapse and compression of the bodies of the vertebra can be seen. Two views are essential, anteroposterior and lateral.

6. The disease may occur following traumatism to the spine at any age, but it is rarely seen in young children.

7. Oftentimes, repeated clinical and roentgenographic examinations are necessary in order that a correct diagnosis can be established. Spinal cord injuries are not usually encountered in cases of Kümmell's disease.

8. The prognosis depends on the early recognition of the disease, and the institution of adequate immobilizing apparatus. In some cases, an ankylosing operation of the spine is advisable.

9. The differential diagnosis from tuberculous spinal caries, back strains, spinal neuroses, hypertrophic arthritis, and the true ankylosing type of spondylitis must be carefully considered.

Complete Complement Fixation Test with Blood Serum

Antigens	Hemolysis Per Cent.
Acetone insoluble lipoids of human heart	100
Kolmer's	100
Chol. alc. ext. of human heart	100
Gonococcus	100
Staphylococcus	100
Streptococcus	100
Pneumococcus	100
Tuberculosis, saline	100
Tuberculosis, Besredka	100
Wassermann reaction	Negative

516 Majestic Building.

ABSTRACT OF DISCUSSION

DR. ALFRED EDWARD GALLANT, Los Angeles: There is no doubt that there are more of these cases than are recognized. At the Los Angeles General Hospital, in the last four years, we have had sixty-six cases of fracture of the spine. Unfortunately, we cannot follow these patients. They are given the routine treatment of rest in bed and plaster jackets and braces, and allowed to go. I operated in a case of Kümmell's disease. A boy, aged 14, was playing in a sand pit. The earth caved in on him, crushing his spine. He was more or less improperly treated, from the history I was able to obtain from his people. He came to Los Angeles when he was 16. He had a very marked kyphosis of the dorsolumbar region, with a beginning pressure paralysis. He was put on a Whitman frame for five weeks in order to reduce some of the kyphosis. Then he was operated on and a double Albee graft was inserted. He was kept on a Whitman frame all the time, even during the operation.

DR. WILLIAM ARTHUR CLARK, Pasadena, Calif.: A man, aged 50, for several years had had prickling and tingling sensations on the back and sides of both thighs. The only history of injury dated back twenty years. His symptoms began about ten years ago. He was unable to get any physician to take any interest in him at that time. Recently his

symptoms have been getting worse and disturbing him a great deal. By putting him to bed, with traction, the symptoms disappeared for a while. He is all right while he is lying down. When he gets up the symptoms return. The roentgenograms show an extreme amount of callus around the fifth lumbar vertebra, evidently the results of the injury sustained twenty years ago when he fell off his horse and landed in a sitting posture on the base of his spine. He did not attribute very much importance to it at the time. I may be wrong in my assumption that this injury is the cause of his symptoms, but I have concluded that he had a compression fracture of the articular processes of the fifth lumbar vertebra which resulted in an exuberance of callus, causing neurologic symptoms.

Fig. 6.—Angular deformity of the fourth lumbar segment.

DR. WALTER G. STERN, Cleveland: In the study of the etiology of Kümmell's disease, which, as I understand it, has nothing to do with compression fracture of the spine, but is a chronic and more or less localized hypertrophic traumatic inflammation of the spine with cord or root symptoms, I had an unusual opportunity to see the work of Professor Kalisko, professor of medicolegal pathology at the University of Vienna, and of the late Dr. George Schroll, assistant to Dr. Lorenz. They were working on the theory of Reidinger and Kümmell that this disease was due to minute traumas to the bone and to hemorrhage into the structures of the spine. They attempted to prove it. At that time we already had very good roentgenograms at the University of Vienna. The roentgenographer was allowed to make all the roentgenograms of living subjects that he pleased, and was asked to diagnose all the traumas to the spinal column. The neurologist was then called in, and was allowed to diagnose whatever lesions he could on the spinal column. The surgeon was called in, and was allowed to diagnose whatever symptoms of fracture or injury to the spine he could diagnose. At the necropsy the spinal column was carefully dissected and all the minute lesions were noted. The different symptoms that had previously been diagnosed were ruled out, and the surprising results showed that practically none of the minor anatomic lesions found in the spinal column had been diagnosed intra vitam. There were minute cracks and fractures into the spine, and there were minute hemorrhages into the bodies, laminae and articular processes of the spine; there were hemorrhages into the ligaments and the lateral structures of the spine, and hemorrhage in the intervertebral disks. So I believe the experiments of Kalisko and the unpublished work of his assistant Schroll will bear out the thought that Kümmell's disease is caused by minute multiple traumas to the osseous and ligamentary structures of the spine, the traumas causing mostly cracks and small hemorrhages.

DR. FOSDICK JONES, Denver: I was much interested in the presentation of Dr. Clark's case. I should judge from his description and from the roentgenograms that this was a case of Kümmell's disease, in which the delayed symptoms occurred several years after the original spinal injury. In Kümmell's last article on this subject (*Archiv für klinische Chirurgie*, November, 1921), he clearly demonstrates the fact which Dr. Stern has spoken of, namely, that the disease does not always result from a compression fracture of the spinal segments, but that in many instances trauma to the vertebral column without compression of the bodies is followed by rupture of the blood vessels and injury to the periosteum and atrophy of the spongiosa of the vertebral bodies, a gradual compression of these segments, with a permanent kyphosis developing. One writer reports two cases in which this disease occurred simply by muscular contraction, and not by direct trauma to the spine. The so-called spinal neurosis or railway spine must be differentiated from Kümmell's disease. It is this type of injury that not infrequently leads to medicolegal investigations.

OBSTRUCTION TO THE LYMPH CHANNELS BY SCAR*

LEO ELOESSER, M.D.
SAN FRANCISCO

Transplants of skin and the underlying soft parts, whether they are made as free grafts at one sitting, or as Italian plastic operations in several stages, are prone to be the seat of an annoying edema. Both the free graft and the Italian plastic transplant are islands of tissue completely surrounded by scar. In both of them edema is likely to persist for a long time, if not indefinitely; and also, when once it has disappeared, to recur. This edema is much less common in pedicled flaps, even in those in which only a very narrow pedicle is retained.

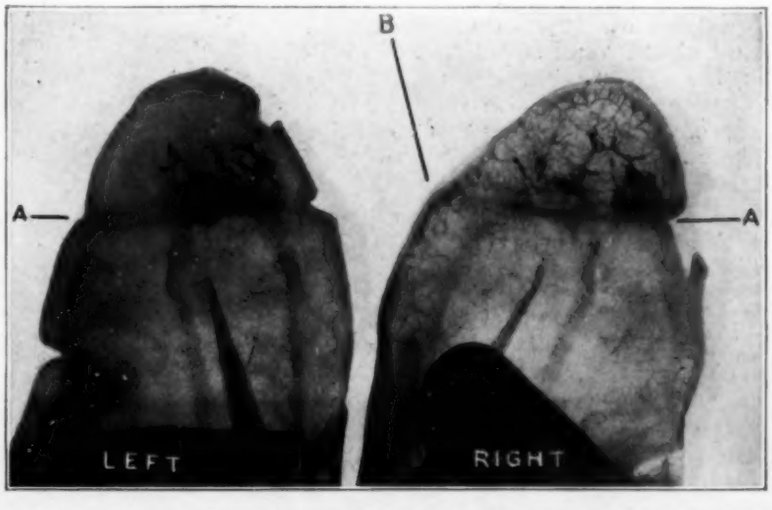

Fig. 1.—A suspension of barium sulphate has been injected into two rabbits' ears distal to a healed scar running across the ear. A roentgenogram of the left ear shows that the barium has been stopped by the scar. The scar on the right does not quite reach the left margin of the ear; while most of the barium stops at the scar, some of it has run along the fine lymphatic arcades at the unscarified edge and has reached the base of the ear. *A*, scar; *B*, unscarified edge.

In an attempt to inquire into the causes of this edema, I undertook some experiments with the help of Drs. Thompson, Eiskamp and Meherin. Once embarked on

* From the Division of Surgery, Stanford University School of Medicine.

* Read before the Section on Orthopedic Surgery at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

them, I have been led afield; questions have arisen that have a bearing on the causes of elephantiasic edema in general.

Clinical observations made during the injection of procain solution for purposes of local anesthesia have some bearing on this subject. Scar tissue offers an almost impermeable barrier to the diffusion of a hypodermic injection. It is almost impossible to infiltrate scar tissue itself, so great is the force required. If one makes the injection alongside the scar, one sees the solution diffuse up and down but not across it. It is impossible to make a satisfactory infiltration anesthesia in scar tissue.

Theoretically, it might seem that the cause of the difference between pedicled flaps and free grafts, the reason why free grafts are liable to be or to become edematous while pedicled flaps are not, might lie in an obstruction presented by scar tissue to the flow of lymph. The difficulties of injecting solutions into scar tissue would be explained by the same theory.

I have not been able to find out from the literature whether lymph vessels possess the power of regeneration and growth through scar tissue or not. Even the very complete older work of Marchand on the healing of wounds, on whose fundamental studies of the regeneration of all manner of tissues—blood vessels, nerves, bone, muscle and various glandular organs—most later work is based, contains no notes on the regeneration and growth of lymph vessels. At the Washington meeting of the American Surgical Association in 1921, Halsted reported some experiments on dogs. He had in several stages severed all of the soft parts of an extremity down to the bone. He was unable to produce an edema by this means. These limbs, whose whole cross section at a certain level, excepting only the bone, consisted of scar, did not become edematous. He concludes, therefore, that an aseptic scar offers no obstruction to the return flow of lymph.

Fig. 2.—Rabbit's ear injected, distal to a scar, with India ink. The lymph channels on the left have not crossed the scar; the large channel on the right has, but its lumen, as it traverses the scar, is much narrowed. *A*, scar. Photograph by Dr. Blaisdell.

Ignorant of these experiments, which Dr. Mont Reid had performed for Dr. Halsted, I had attacked the problem in another way. Halsted's object was completely to sever all the lymph vessels of a limb. We chose, instead of a limb, the severance of whose lymphatics offered considerable technical difficulty, the rabbit's ear. We severed the skin of the dorsum only, considering that an incision through one surface of the ear alone would accomplish a complete scarification of the lymph vessels of this surface. The two surfaces of the ear are separated by a broad, thin leaf of cartilage; no lymph vessels traverse the cartilage. There is therefore no direct lymphatic connection between the two surfaces of the ear. We made incisions through the dorsum of rabbits' ears down to the cartilage, but usually not through it. These incisions were allowed to heal, and after varying intervals, a suspension of barium sulphate or India ink was injected under the skin of the ear distal to the scar.

It was difficult to inject the barium sulphate into the lymph vessels. The suspension often spread through the subcutis and gathered about the site of injection as an irregular blob. In a few animals, however, we were able to inject the vessels themselves. In all of them the scar offered a complete obstruction to the passage of barium. In one (Fig. 1) the barium filled not only the larger lymph vessels accompanying the central artery, but also the finer arcades at the very margin of the ear. The scar did not quite reach the margin of the ear, so that the marginal arcades remained unobstructed and the barium traveled in them to the base of the ear. Although it was not possible to make satisfactory photographs of the specimens injected with India ink, the ink was better suited to our purposes than the suspension of barium sulphate.

When the India ink was injected slowly, first a round spot of black was observed to appear beneath the skin; suddenly from this spot, at one point or another, the ink darted into a lymph vessel, along which it ran rapidly, sometimes spreading from a main large vessel into smaller branches, sometimes entering simultaneously several smaller branches near the site of injection. It rapidly coursed along the vessels until it reached the scar, when it stopped. If one continued to inject, it fairly slowly made its way across the scar, evidently along minute constricted channels; but once the passage of the scar was accomplished it again ran along rapidly, filling out the large lymph channels as before. In some animals the incision was not carried completely across the ear: when these ears were injected, the ink would run up to the scar, and then instead of crossing it, would deviate to one side or another, or would flow backward along small channels until it struck the unscarified portion of the ear, along whose uninterrupted lymph spaces it would proceed and by this route fill out the channels in the distal part of the ear.

These experiments, then, showed that scar causes a relative stenosis of the lymph channels, obstructing the passage of grosser particles (barium sulphate) but not of finer ones (India ink). This obstruction persists in a scar several (four) months old.

It is noteworthy that although the lymph vessels of these ears were partially obstructed, the ears were not edematous. This is the same result that Halsted obtained. He was unable to produce an edema by severing the lymphatics. He considered that the chronic edema, the surgical elephantiasis seen after operations involving the lymphatics, such as operations for cancer of the breast with removal of the axillary glands, was due not to a severing of the lymphatics but to a chronic infection.

Following this lead, we made some further experiments whose final results I am not yet in a position to report, but which gave interesting information.

In the specimens mentioned above, the ink has beautifully outlined a well defined tracery of lymphatic vessels. In a second series of rabbits we were unable to inject the lymphatics at all.

The ears of these animals we inoculated with a strain of streptococci given us by Dr. Stone of Dr. Gay's laboratory at the University of California. The strain is one isolated by Dr. Gay from an empyema and mentioned by him in numerous publications. With it he has succeeded regularly and constantly in producing an erysipelas. A number of our animals died after inoculation of the fresher and more virulent strains. In from twenty-four to thirty-six hours their ears were red and intensely swollen, and hung down heavily at the side of the head. Those that died had effusions into the chest, pericardium and abdomen, some of them pneumonia. In those that survived, the erysipelas gradually subsided, leaving at the end of a week or ten days a barely perceptible edema and thickening of the skin of the dorsum of the ear. Injection of older and less virulent cultures produced much milder reactions, some almost no reaction. The scar offered no impediment to the progress of the erysipelas.

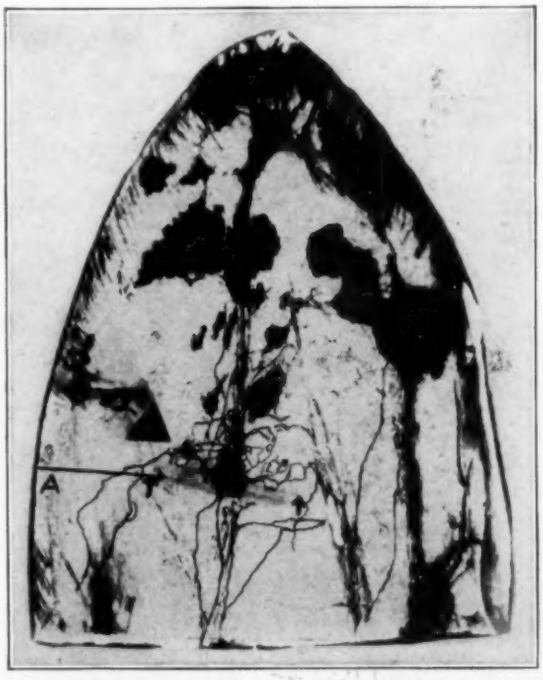

Fig. 3.—A short scar (its length indicated by the two arrows) traverses the whole thickness of the ear. The injection has traveled around the scar, but two fine lymph channels (the middle ones) cross it. During injection it could be seen that the tracery of lymph vessels distal to the scar filled, not by way of the fine vessels crossing the scar, but by the vessels to the right, entering these and then running backward toward the scar through the middle vessels. *A*, scar. Photograph by Dr. Blaisdell.

The lymph channels of these ears, both the more acutely erysipelatous ones and those whose erysipelas had subsided, could not be injected with ink. In some of them, when much force was used, a few channels filled with ink, but slowly and imperfectly. In most of them, no matter what the force, the ink spread diffusely around the site of injection without finding its way into any channels. The channels were completely blocked. It is curious and interesting to note that this block occurred, and that it was impossible to inject the lymphatics not only in the acutely and subacutely erysipelatous ears, but also in those whose erysipelas had subsided and which showed few, if any, signs of their past disease.

CONCLUSION

Further experiments on the production of elephantiasis by repeated injections of bacteria, and studies on the permanence of the inflammatory lymphatic block, are in progress. This much, however, I am able to report: A healed scar partially, but not completely, obstructs the lymphatics; there is some, but not a perfect regeneration of the lymphatics across it. Infection with a certain strain of streptococci (Gay) completely blocks the lymphatics.

135 Stockton Street.

ABSTRACT OF DISCUSSION

DR. WALTER G. STERN, Cleveland: The subject of edemas and swelling, particularly after injury, is of constant interest to us, but I do not think that they have been explained as yet, and I am sure that the beautiful experimental physiologic work done by Dr. Eloesser and others will one day shed some light on why these various edemas persist after injuries. It is well known that in many cases in which, for instance, a fracture of the tibia has occurred in a limb that had been previously normal in size and circulation, the edema has persisted as high as the middle of the thigh. Such a phenomenon has never been satisfactorily explained. Dr. Nathan of New York attempted to explain the edema and the swelling of the soft parts after comparatively simple fractures. His experiments showed that the soft parts were damaged for at least 2 inches above and below the site of injury. He believes that he can show how in certain simple Colles' fractures that are caused not by direct violence but by a little slip and a little pressure on the palm of the hand, as in a light person falling down or off a chair, the edema may persist in the fingers and the forearm 3 or 4 inches above the seat of the fracture.

DR. LEROY P. KUHN, Chicago: When I first began to look into this subject, I was at a loss for a time to realize just what more could be accomplished than had already been done by Kondoleon in his operation—changing the lymphatic circulation. It seems to me that scar tissue offers the chief barrier and is the one thing we have to overcome in this work. Dr. Eloesser has shown in his experiments how the circulation can be forced through connective tissue. From the information that we now have on this subject, we are in a position to start out and do a great deal of work for the benefit of the patient. Of course instead of having edema that has been formed and the ill effects resulting from it, with the enormous scars that we sometimes see, we may in time be able to bring about a much better result.

DR. EMMET RIXFORD, San Francisco: There is evidence that lymph vessels have a considerable capacity for regeneration; but whether the new vessels will go through scar tissue in sufficient size to drain properly is a question to be determined. The time element is probably of enormous importance. We know clinically that in a great many of these cases, the edema is not permanent; that if one waits long enough, the edema, even in a very extensive transplant, often disappears. For example, I have one observation of a transplanted flap, measuring approximately 4 by 8 inches, from one leg to the other, which was edematous for about a year. The edema gradually lessened and finally disappeared altogether. One has to distinguish between real edema and apparent edema. If one transplants a piece of skin to a man's nose, it is very apt to appear afterward like a knob, something obviously stuck on. That is due to contraction of the scar at the base and in the periphery—pushing up the center—and may be called apparent edema, whereas the actual edematous features of it are comparatively slight. As the scar stretches, the prominence disappears and the transplant becomes flat. The eventual thinness of the scar in these cases probably accounts for the opening up of passages through it. It is, perhaps, a quantitative question. Blood vessels open

up through scars in order to nourish these flaps that have been transplanted, and it seems reasonable to suppose that the vessels of the drainage system will also penetrate; but whether they open up enough to permit ready experimentation is another matter. The granules of India ink are exceedingly fine, but fluid may pass where ink granules may be stopped. One or two ideas occur to me in the matter of the relation of infections to the blocking of lymph vessels and spaces. I am thinking particularly of the edema that occurs in the skin after extensive infiltration of cancer of the breast. That edema is not primary; it occurs apparently only after Nature has done all it can to drain the area by means of the anastomoses of the lymphatic channels, the process being something like this: If the lymph vessels which normally drain a certain area are obstructed by carcinoma, there is lymph stasis; back pressure is effective in opening up the anastomoses of the lymph vessels, which are chiefly in the periphery. Then cancerous cells pass with the lymph into some neighboring system of lymphatics which is in turn blocked, and so on, until finally one after another of the available channels is obstructed and the drainage system breaks down when they are all obstructed. It is then that we have the pigskin edema. I can conceive that infection of a certain proportional degree of virulence might do the same thing, possibly by plastic exudation, possibly by actual physical destruction of the lining of the cells of the lymphatic spaces. The whole matter is exceedingly interesting. Dr. Eloesser's experiments, while not complete, are of determinative character and will be a most valuable contribution to this rather embarrassing subject.

DR. LEO ELOESSER, San Francisco: In speaking of the edema occurring after cancer of the breast, I had reference more to the edema of the arm, which is seen at varying intervals, not only immediately following operations, but also, sometimes quite inexplicably, a year or two or more after the operation, without any evidence of recurrence of cancer. It is this that Halsted so beautifully discusses in his last article on surgical elephantiasis. It seems to me, furthermore, that Dr. Rixford has probably hit the keynote when he says that the lymphatic obstruction due to scar is one of degree. I think these lymphatics are partially but not completely obstructed; and when some slight infection occurs which normal lymph vessels could carry off, the constricted vessels cannot, and edema results. This is only theory, and not as yet substantiated.

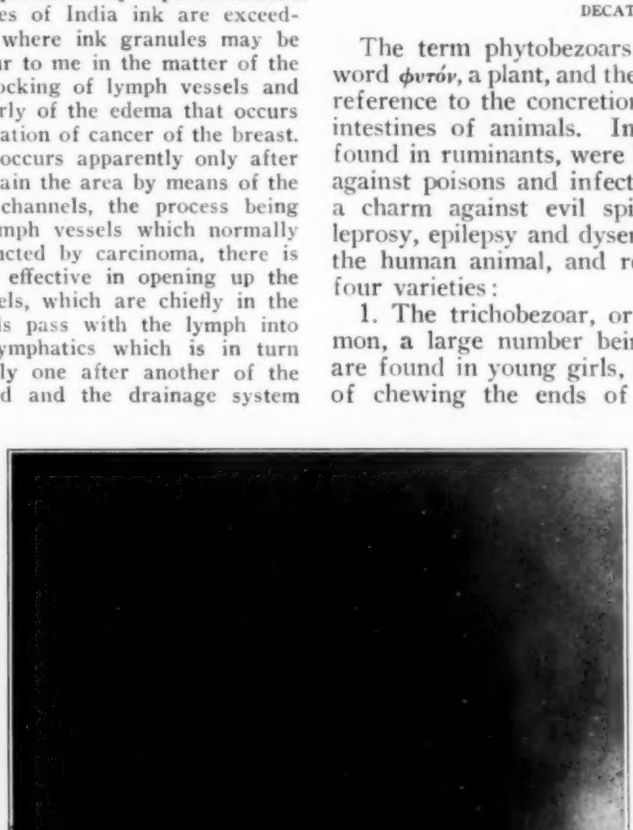

Fig. 1 (Case 2).—Mass in stomach.

Future of Health Officer.—In these progressive times there is a magnificent future for the medical officer of health. "Prevention is better than cure," and though he will frequently be expected to prevent the unpreventable, and remove the irremovable his opportunities to improve the physical condition of the people will be abundant, and his influence for good on the health of the community enormous. In all circumstances, and on every possible occasion, he should strive to work hand and glove with the practitioners in his district—his work then will be far easier of accomplishment and more satisfactory in achievement than if a state of armed neutrality or open warfare existed between him and them.—E. B. Turner: *Lancet* **2**:771 (Oct. 6) 1923.

PHYTOBEZOARS *

W. E. HART, M.D.
DECATUR, ILL.

The term phytobezoars is dervied from the Greek word *φυτόν*, a plant, and the Persian word bezoar, having reference to the concretions found in the stomach and intestines of animals. In ancient times, the bezoars, found in ruminants, were highly esteemed as a remedy against poisons and infectious diseases, being worn as a charm against evil spirits, snake poisons, plague, leprosy, epilepsy and dysentery. The bezoars found in the human animal, and removed at operation, are of four varieties:

1. The trichobezoar, or hair-ball, is the most common, a large number being reported. These bezoars are found in young girls, who have acquired the habit of chewing the ends of the hair, or that of rolling combings or pulled hair into small compass, and swallowing it. These masses often attain the size of a complete cast of the stomach.

2. The trichophytobezoar is a bezoar consisting largely of hair, with fibers of vegetable matter and food detritus enmeshed in the hair. These should be classed as trichobezoar.

3. The shellac concretion is found in painters, or workers in furniture factories where a strong alcoholic solution of shellac is used as a polish. This is sometimes swallowed straight, but those of more refined tastes add water, which precipitates the shellac. Cases have been reported by Hallas,[1] Tideman, Grauer, Friedlander and Vonnegut. These masses may attain a large size also, the two reported by Hallas weighing 1,745 and 2,000 gm., respectively.

4. The phytobezoar, or food-ball, so called, consists of the skins, seeds and fibers of fruit or vegetable matter, such as persimmons and prunes, salsify, celery with food detritus, such as starch granules, especially those of the potato, fat globules, striated muscle fibers, elastic tissue, fatty acid crystals, and squamous epithelium. These are rare, only five cases being recorded, those of Schreiber,[2] Peple,[3] Outten,[4] King[5] and Dr. Quain for Dr. Buckwill.[6]

* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

1. Hallas, E. A.: Ueber Schellackconcremente im Magen und Duodenum, Berl. klin. Wchnschr. **51**: 440 (March 9) 1914.
2. Schreiber, J.: Ueber einem Phytobezoar in Magen einer Frau und dessen Diagnose; Operation; Heilung, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **1**: 729, 1896.
3. Peple, W. L.: Globus Diospyri Virginianae Seminum, Report of a Case, Virginia M. Month. **48**: 596 (Jan.) 1922.
4. Outten, W. B.: A Case of Double Gastrolith Removed by Gastrotomy; Recovery; Death by Phthisis Three Months Afterward, M. Fortnightly **6**: 445, 1894.
5. King, H. P., cited by Outten (Footnote 4).
6. Quain (for Dr. Buckwill): Stomach of an Insane Patient Filled with Cocoanut Fiber, Which Caused Death by Perforation, Tr. Path. Soc. London **5**: 145 (May 16) 1854.

The eight cases reported in this series presented no hair and belong to this variety, *Diospyros virginiana*, or common persimmon, largely composing the mass in six of the cases, a considerable quantity of celery fibers in the seventh and prune and raisin skins and stems in the eighth. Schreiber reported a case in 1896 in which a mass was removed at operation from the stomach of a peasant woman. This mass measured 12 by 6 by 5 cm., with a maximum circumference of 20 cm., and was composed of plant cells and tangled compressed plant fibers, with scattered micrococci and masses of detritus. The patient related that she had been in the habit of eating large quantities of blackroot, a variety of salsify. Dr. Charles Martin[7] of Dallas, Texas, related a case in which a bezoar was removed from the stomach of an inveterate tobacco chewer, which was thought to consist largely of tobacco. No inquiry was made as to the ingestion of persimmons. Persimmon-bezoars are compact masses, and may be roughly spherical or conical, with the apex somewhat flattened, bases smooth, edges rounded, and showing the effect of attrition, as in the case of Outten. They may have a wide base and narrow body, corresponding to the fundus or pylorus, They may even be cylindric, as in Case 7, owing to the fact that the mass passed through a gastroenterostomy opening and lodged in the small intestine, causing obstruction.

They can be readily fractured with the fingers, having somewhat the consistency of putty or clay. The surface is usually greenish-yellow, or mottled light and dark brown, or they may be covered with a carbonaceous deposit.

Fig. 2 (Case 3).—Appearance of stomach.

The seeds of the persimmon may be seen sticking out from the surface like peanuts in peanut candy. The average size is about 8 by 5 cm. They lose much of their size and weight when dried. In Outten's case, in which two bezoars were found, they measured 12.5 cm. (5 inches) and 6.9 cm. (2¾ inches) in lengh. The circumference at the base of each was 27.5 cm. (11 inches).

The combined weight, one-half hour after removal, was 1,560 gm. Four days later they weighed 617.6 gm.

Hooyker[8] of Groningen removed a phytobezoar at necropsy weighing 880 gm. (28 ounces). This mass had the outline of and almost filled the stomach, which was considered of normal size. The composition was not given. These bezoars will immediately rise to the surface of a receptacle containing an opaque meal, gradually settling as the barium precipitates. The odor has been described as that of fermenting fruit in the recent cases, but is usually that of stomach contents during digestion. On broken sections these show more or less homogeniety, of a brown or yellowish brown, with the seeds, skins and fibers distributed irregularly throughout. They may or may not have a seed or number of seeds forming a matrix. Digestants, of the strength usually tolerated by the stomach, have no effect on these masses.

ETIOLOGY

The mode of formation of these bezoars is not definitely known. One writer attributes their formation to the fact that the persimmon contains 14.10 per cent. of gums and pectin[9] which favors cohesion. The muscular action of the stomach undoubtedly is a factor in molding and compressing these masses. In three cases hyperacidity was present, and in two of these gastric ulcer was demonstrated, the ulcer history antedating the ingestion of the persimmons. It is possible that the hyperacidity may predispose to their formation. The skins and seeds may be seen on the surface of the bezoars, which suggests that little if any is added after their original formation.

SYMPTOMS

The symptoms are those of an acute gastroenteritis of a severe type, occurring as a rule soon after eating the persimmons, or there may be a delay of a few hours to a day or two. With the subsidence of the acute symptoms, which may last several days, the patient may feel fairly comfortable, but there is rarely a complete return to normal. There may be nothing more than a sense of fulness or weight in the epigastrium, or there may at any time be a complete recurrence of all the symptoms. Attacks of diarrhea alternating with constipation of an obstinate type are common.

In the two cases complicated by gastric ulcer, the symptoms were attributed to the ulcer. In one case the lump could be felt by the patient while in the recumbent position. The pain may be referred to the kidney region or to the groin, and in one case to the right or left eye. Increase in temperature and pulse rate are usual during the acute attacks, and often during the exacerbations. Pressure over the tumor elicits no particular pain or even marked tenderness. Eating may increase or diminsh pain, even when complicated by gastric ulcer.

CLINICAL DIAGNOSIS

The value of a carefully taken history is here again emphasized in diagnosing this condition. The presence

7. Martin, Charles: Personal communication to the author.
8. Hooyker, cited by Bruen, E. T. (quoted by Outten, Footnote 4).
9. Constituents of the Pulp of the Persimmon, Bull. 60, Purdue University Agricultural Experiment Station.

of a very freely movable tumor in the epigastric or umbilical region, which is not painful to pressure, unless complicated by some other pathologic condition such as gastric ulcer, and which may disappear and reappear during examination or on change of position of the patient, unless held in position, is significant. With this, the history of the ingestion of persimmons, followed by the symptoms of a severe type of gastro-enteritis, usually within a few hours, which subsequently subside, only to recur probably in a few days, makes a picture hard to reconcile with any other pathologic condition. The mass remains within the stomach and moves with peristalsis.

Urine, blood and stomach analysis show no changes in uncomplicated cases. There is no great loss of weight, as a rule, yet Schreiber reports one case in which the patient was emaciated, this case being the one in which a phytobezoar composed of salsify fibers was found. They have been known to pass through a

Fig. 3 (Case 6).—Ulcer crater on lesser curvature and mass in pars cardiaca.

gastro-enterostomy opening and lodge in the small bowel, completely occluding the lumen. Such was the condition found in Case 7. This occurrence illustrates how easy it is to overlook their presence, even when the stomach has been surgically treated for some other pathologic condition. The history of the patient's having eaten persimmons was obtained after the second operation. He had eaten persimmons once only, in October, 1920. Erroneous diagnoses have been made, such as floating kidney, carcinoma, tumor of stomach, movable spleen, hair-ball, polyp and adenoma.

The possibility of multiple bezoars must not be overlooked, as Outten reports that after removal of one bezoar, the stomach was sutured; when a second one, half the size of the first, was discovered, necessitating a second incision for its removal. It would seem hardly possible to overlook a body 2¾ inches in length and weighing 220.8 gm., but such are the facts.

The quantity of persimmons eaten bears no special relation to bezoar formation, as one patient swallowed, unintentionally, one unripe persimmon and within an hour two apples. It is possible that the character of the vomitus, being usually watery or of mucus, is due to the bezoar acting as a ball-valve in the cardiac antrum, preventing the ejection of food material.

ROENTGENOLOGIC

With the ingestion of the barium meal, the mass is likely to be seen in the antral portion of the stomach, depending somewhat on the size, as a clear round shadow, or light area, in the darker shadow of the barium. The appearance may suggest a large air bubble or filling defect, which may be seen to rise out of the antrum and float to the surface of the meal. Pressure over the stomach may displace the mass, which may rise above the level of the barium, showing as a rounded shadow in the clear air space in the fundus of the stomach.

When the bezoars are large, the meal may be seen to form as a cap covering something in the stomach, and canalize along the greater or lesser curvature, between the mass and the stomach walls.

The displacement of the intragastric mass can be observed as it is moved upward or sidewise by manipulation.

The shadow may disappear entirely, to reappear when bimanual pressure is exerted over the lower thorax. As the stomach empties, the barium streaked mass may be seen in the lower part of the pars cardiaca or pars media, depending on the relative size of the bezoar and of the stomach.

DIFFERENTIAL DIAGNOSIS

A. Trichobezoar:
   1. Female, with long hair; may get history of hair chewing or swallowing.
   2. May crepitate.
   3. Hair sometimes vomited, or may be found in the stools.
   4. Hair may be found following gastric lavage.
   5. Gradual formation.

B. Phytobezoar:
   1. Tumor extremely mobile.
   2. Males more common.
   3. Does not crepitate.
   4. Acute gastro-intestinal attack.
   5. Rapid formation.
   6. History of ingestion of certain fruits or vegetables.
   7. May be canalization of barium in hair-ball and bezoar.
   8. Hyperacidity common; may be complicated with ulcer.

C. Carcinoma:
   1. Filling defect constant.
   2. Hypo-acidity common.
   3. Tumor not so freely movable.
   4. Emaciation of variable extent.
   5. Age.
   6. Pain usually on palpation or pressure.

D. Other tumors of the stomach:
   1. These show constant defects.
   2. Nonmobile.
   3. Do not disappear and reappear.

E. Polyps with long pedicle:
   1. May get dimpling at point of attachment of pedicle.

TREATMENT

The treatment is essentially surgical, though other methods have been tried and good results recorded. Digestants have no apparent effect on these masses outside the stomach. Massage proved effective in one case reported by Outten, who, citing King, states that a tumor was demonstrated in the stomach of a boy,

aged 14 years, who gave a history of having eaten a quantity of persimmons. Massage of the tumor resulted in the natural voiding of a quantity of persimmon seeds and skins after two weeks' treatment. This method is uncertain and even hazardous in cases complicated by gastric ulcer. Through the kindness of

Fig. 4 (Case 8).—Mass near pylorus.

Drs. Mills and Simpson of St. Louis, I report a case (Case 8) in which a bezoar was demonstrated roentgenologically. Diluted hydrochloric acid was given because of an achylia gastrica. Within a few days, hard, black masses were evacuated in the stools, which were found to consist of vegetable detritus, apparently prune and raisin skins, with pieces of raisin stems. The conclusion was that the hydrochloric acid resulted in the disintegration of the mass by a stimulating proteolytic action, dissolving the vegetable cement substances. Roentgenograms taken later showed an apparently normal stomach, with no evidence of the bezoar shadow remaining.

The necessity of a thorough exploration of the stomach at the time of operation may well be emphasized, bearing in mind the possibility of multiple bezoars, and the fact that these bezoars may be found in the extreme cardiac antral region. The incision through the parietes should be large enough to admit the whole hand of the operator.

In the first seven cases, gastrotomy was performed, with one death, from peritonitis five days later, said to be due to the fact that the patient drank the contents of a hot water bottle soon after the operation. In Outten's case, pneumonia developed on the eighth day, death from phthisis following three months later.

REPORT OF CASES

CASE 1.—S. B., a man, aged 54, a teamster, patient of Dr. Don Deal of Springfield, Ill., ate heartily of persimmons, Oct. 10, 1918. Within six hours, vomiting and purging commenced. There was a palpable mass in the left abdominal region. The patient experienced great pain, paroxysmal in character, accompanied by retching, vomiting and purging. A five-hour roentgenogram showed a filling defect in the pars media. A diagnosis of pyloric obstruction was made. Gastrotomy was performed, Feb. 3, 1919. A foreign body said to consist of persimmon seeds and skins was removed. The patient died, February 6, of peritonitis, said to have been caused by his drinking the contents of a hot-water bottle soon after the operation. The duration of the condition was 116 days (nearly four months).

CASE 2.—C. R. B., a man, aged 39, a farmer, patient of Dr. Will Wood of Decatur, Ill., was a heavy drinker. He had had no digestive trouble before. Dec. 5, 1922, he ate about 1½ pints of persimmons and some cranberry sauce. Four hours later he experienced severe pain in the epigastrium, with nausea but no vomiting. The pain continued for three or four days. The vomitus consisted largely of mucus, and was very sour. A diagnosis was made of foreign body in the stomach, probably a persimmon mass, based on the observation of a mass at the roentgenologic examination, and the patient's affirmative answer in regard to the ingestion of persimmons. A gastrotomy was performed, Jan. 12, 1923. A bezoar consisting of persimmon seeds and skins and other food débris, 3 by 2 by 1½ inches, located in the extreme cardiac portion of the stomach, was removed. Recovery was uneventful. The duration was five weeks.

CASE 3.—C. H., a man, aged 38, a farm hand, patient of Dr. Charles L. Patton of Springfield, Ill., on Thanksgiving Day, 1921, ate a regulation dinner of chicken, potatoes, cheese, stewed cranberries, and a large quantity of celery. A day or

Fig. 5 (Case 8).—Mass in fundus.

two after, he began to notice a sensation of fulness in the epigastrium, with dull pain, coming on once or twice a week, usually very soon after meals, but occasionally an hour or two after eating. The pain was usually worse in the afternoon or evening. It was always relieved by alkaline powders. December 1, he felt sick, and did not eat. The next day he felt a dull pain before breakfast, which later developed into severe cramping. The pain was in the epigastrium. It con-

tinued for four days despite much calomel and salts. He vomited several times, the vomitus consisting of large amounts of bile-stained material without blood. Morphin finally relieved him. Since then he had had more or less cramping about navel. Any but the lightest liquids increased the epigastric pain and also caused pain in the lower part of the abdomen. Bowel movements and enemas gave only temporary relief. The patient had had no fever that he knew of. An Ewald meal gave: free acid, 92; total, 112. No diagnosis was definitely made. Operation was performed, Feb. 4, 1922. A mass the size of a small hen's egg was found in the small bowel about 6 inches from the ileocecal valve. The bowel was ulcerated, and almost perforated at this point. The bowel was opened, and a foreign body 2 by 1½ by ¾ inches

Fig. 6 (Case 8).—Mass near cardia.

was removed. Further examination revealed a mass in the stomach, which was removed. This mass measured 3 by 2½ by 2 inches, and consisted of some form of vegetable fibers, matted together with mucus and resembling a shredded wheat biscuit. The mass was completely covered with a layer of mucus, bile tinged, and dark green. There has been no cramping since the operation. The duration of the condition was seventy-six days (2 and one-half months).

CASE 4.—Miss A. C., aged 40, a patient of Dr. M. P. Parrish of Decatur, Ill., had occasional attacks of indigestion. She ate a large quantity of persimmons on the evening of Nov. 16, 1921. She had considerable pain soon afterward, and used methods to promote vomiting, which, together with a purgative, relieved her. No preoperative diagnosis was made. A gastrotomy was performed, November 23, and a bezoar was removed, the size and shape of a goose egg, consisting of persimmon seeds and skins. Recovery was uneventful. The duration of the condition was seven days.

CASE 5.—N. S. F., a man, aged 53, a brass finisher, patient of Dr. M. P. Parrish of Decatur, Ill., had had no previous stomach trouble. Nov. 8, 1919, while out coon hunting at 1 a. m., he ran across a persimmon tree. While tasting the fruit, he unintentionally swallowed one unripe persimmon. He returned to camp in a half hour, and ate two small apples before retiring. In a short time pain was noticed in the epigastrium, accompanied by nausea and vomiting. He felt as if there was a ball in his stomach which should come out. The vomiting ceased the next day, when a severe diarrhea began, which lasted about two weeks. Constipation then supervened, necessitating laxatives nightly. The pain was frequently felt, always coming on when the stomach was empty, and always being relieved for two or three hours after eating. The stools were always black at this time. The vomitus was always very acid. No preoperative diagnosis was made. Gastrotomy was performed, Jan. 28, 1920. A bezoar the size and shape of a large goose egg, consisting of persimmon seeds (?) and skins was removed. Recovery was uneventful. The patient now has occasional sensations of distress after eating. Acid foods cause no particular distress. Constipation persists. The duration of the condition was eighty-one days.

CASE 6.—J. S., a man, aged 35, a farmer, patient of Dr. F. E. Smith of Decatur, Ill., had had stomach trouble for eight years, consisting of severe pain in the epigastric region, with eructations of a very sour material. Acid food always increased and other food always relieved the pain. The patient ate a considerable quantity of persimmons in November, 1921. He was awakened during the night by a very severe pain in the epigastrium, with nausea, and vomiting of mucus. He could feel a lump in his stomach when lying down. He vomited considerable blood one week before operation. Gastric analysis revealed: total acid, 74; occult blood, ++++. A diagnosis of ulcer of the stomach was made. Roentgen-ray examination showed an ulcer crater on the lesser curvature and a mass in the pars cardiaca the significance of which was not appreciated until the mass was felt and the stomach opened. Gastrotomy revealed a bezoar half the size of a fist, consisting of persimmon seeds and skins and other food débris. The patient recovered. The duration of the condition was nine months.

CASE 7.—F. M., a man, aged 53, a hardware merchant, patient of Drs. A. F. Sippy and Carl Davis of Chicago, had had pain in the epigastrium, coming on three or four hours after meals, for many years. Eating always relieved him. Sodium Bicarbonate, 1 dram, also would relieve him, until a year or so before the present trouble; since then it only nauseated him. In November, 1920, he ate a large quantity of persimmons. He had never eaten them before. After eating them he felt "sick all over." Purgatives moved the bowels, but no relief from the pain was obtained. The pain lasted four or five days, and then gradually subsided. He had a number of similar attacks until May 8, 1922, when he entered the Presbyterian Hospital under the care of Dr. A. F. Sippy. Physical examination revealed no palpable mass. Gastric analysis showed hyperacidity. Roentgen-ray examination revealed a gastric ulcer of the lesser curvature. Diet and treatment for four or five weeks produced no material improvement. Malignancy being suspected, the patient was transferred to the service of Dr. Carl Davis, who operated, June 5. An incision was made in the left rectus, and the upper part of the abdomen was explored. The gastric ulcer was resected, and proved to be benign. Gastro-enterostomy was performed in the usual manner. No evidence of a mass in the stomach was noted. Recovery was uneventful. The patient was discharged, June 18, 1922. Feb. 3, 1923, he was seized with a severe pain in the epigastric region. Three hours later the pain, now of very severe character, shifted to the umbilical region. Vomiting supervened. A diagnosis of intestinal obstruction was made by Dr. Carl Davis, and operation was performed, February 5. A large foreign body was removed from the small bowel a few inches distal to the site of the gastro-enterostomy. This mass was cylindric, 3 inches (7.5 cm.) long, and 2 inches (5 cm.) in diameter, consisting of a "yellowish homogeneous material surrounding the mass of persimmon seeds which formed the matrix of the body." The mass had a nodule or shoulder at one point. Recovery was uneventful. Three series of roentgenograms did not reveal the presence of the bezoar. The duration was approximately two years, two and one-half months (819 days).

CASE 8.—Mrs. W., a middle-aged, slender woman, highly neurotic and very introspective, patient of Drs. R. Walter Mills and Guy Simpson of St. Louis, was referred complaining of vague, not especially indicative, dyspeptic symptoms. She had herself noticed a very easily palpable epigastric tumor, which was evident on inspection. A test meal revealed

Fig. 7 (Case 8).—Normal stomach after disintegration and evacuation of mass.

achylia gastrica. A roentgen-ray examination indicated a very evident intragastric defect in the pyloric region of the stomach. The impression was that of a benign adenoma, the size of a small fist. On manipulation, it was found that the tumor could be readily dislocated to any portion of the stomach. The idea of a pedunculated tumor was entertained. Dr. Simpson, discovering the achylia gastrica, administered dilute hydrochloric acid, and within the next few days hard masses were evacuated in the stools. These masses were quite black, showed fractured surfaces, and on examination were found to be composed of vegetable detritus, apparently prune and raisin skins, bits of raisin stems, etc. After the recovery of this mass in the excreta, the tumor disappeared from the stomach. It seems possible that the administration of the hydrochloric acid resulted in the disintegration of the tumor, perhaps by a stimulating proteolytic action dissolving vegetable cement substances.

ABSTRACT OF DISCUSSION

DR. F. A. KINSLOW, San Francisco: It is interesting to speculate just why these masses should form, and the association with hyperacidity in nearly all of the cases, and with ulcer in some cases, seems to have some significance. In most cases gastritis was present. The symptoms came on very soon after the mass had been ingested. Also, the mass seems to have been formed soon after it was ingested, as the outside seemed to be covered with persimmon skins, which would not have been the case if it had been added to. In the coconut fiber mass and the celery mass, the mode of formation must be different from the formation of the persimmon mass. Probably their mode of formation was similar to the hair-ball formation. I think they were added to. It seems significant that more of these cases are not seen. Dr. Hart picked up his cases away above the persimmon belt, and there would seem to be more of these cases that are either not recognized, or the symptoms are of such a trivial nature that the patients carry the masses around for years and never consult a physician.

DR. SIDNEY K. SIMON, New Orleans: I have not encountered, knowingly, any bezoars. But, if Dr. Hart, living in an Illinois community, where fruit ingestion is not unusually high, encountered so many cases, I believe that it will be found that the presence of these food masses, or bezoars, is a great deal more common than we have had reason to believe from the present statistical information. The point that is stressed particularly is the fact that these cases may simulate carcinoma of the stomach, both from the clinical side and from the radiologic side. It is very possible that some of the so-called inoperable carcinomas of the stomach are allowed to drift, and possibly some of those that turn up as miraculous cures without operation are, in fact, cases of food collections in the stomach belonging to the bezoar class.

DR. W. E. HART, Decatur, Ill.: I did not touch on the differential diagnosis. Hair-ball occurs in females, only one case in a male being reported. This man had a long beard which he was in the habit of chewing. Hair-balls may crepitate, and form slowly, with no history of an acute gastroenteritis, as in phytobezoars. There is usually no marked disturbance in nutrition in phytobezoars, but there may be in a hair-ball, as the mass is augmented by the continued process of hair swallowing. A history of the ingestion of persimmons is significant. In carcinoma, loss of weight is the rule; the tumor is usually painful to pressure; the filling defect or shadow is constant in location, and cannot be moved from one end of the stomach to the other, as in bezoars. The gastric analysis is very likely to show hyperacidity in the various types of bezoars, as in the three of the seven cases reported. In other tumors, such as fibroma, engioma and papilloma, the filling defect or shadow is constant, and cannot be changed materially.

Clinical Notes, Suggestions, and New Instruments

SUBSTITUTE FOR FRACTURE BED IN CASES OF FRACTURE WITH LARGE CASTS

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When a patient is placed in a large cast, such as a double spica, there are certain difficulties which occur in the nursing, and various frames and special types of beds have been

Patient lying in hospital bed on special mattress with middle section removed.

devised to aid in the care of the patient. A recent case occurring in my practice was that of an electrical engineer with a subtrochanteric fracture of the femur. A Lane plate was applied and the patient placed in a double spica cast extending from the nipples to the toes on the side involved, and to the knee on the other side. He was then placed on a "fracture bed" with a mechanical contrivance for lifting

the frame on which he lay. The bars of the frame were not wide enough; it caused him some discomfort, and additional nurses were required to manipulate the apparatus. This, with the mechanical inconsistencies from an engineering standpoint, added to the nervous strain and resulted in a search for a satisfactory substitute.

The special frame and bed were discarded, and a sectional mattress the width of the bed and in three sections was secured and placed on rather wide slats across the spring. The section at the head of the bed measured 36 inches, the middle section 15 inches, and the section at the foot 24 inches, thus giving a mattress of the usual length and width for hospital beds. A piece of "compo" board 15 inches wide and as long as the width of the bed was fastened to the under surface of the middle section, and handles were sewed to each end, making it easy to grasp and slip back and forth under the patient, who in the meantime raises himself slightly with his elbows and is supported by the upper and lower sections. Thus, one nurse can easily insert a bedpan by merely withdrawing the middle section. The mattress can be turned one section at a time, and by covering each section with separate sheeting the bed can be made with ease. By drawing the lower section to one side, a wider range of motion is afforded the free knee.

This type of mattress is comparatively inexpensive, and has the additional advantage of being useful on any bed when not in use for special cases. It obviates the usual method of calling in the "whole force" when such a patient has to be moved, and avoids the usual risk to the affected part.

300 La Salle Building.

PERINEAL HERNIA *

JOSEPH D. HEIMAN, B.S., M.D., CINCINNATI

Hernias are of frequent occurrence and the subject is a large one about which much has been written, but there are few cases of perineal hernias on record. In 1918, Moschcowitz [1] pointed out that, owing to the number of defects made in the fascia of the pelvic outlet by the urethra, vagina, rectum and blood vessels, perineal hernias might be expected to be common. In spite of this, going back in the literature as far as the eighteenth century, he could find only twenty-eight typical cases. The case here reported is of such a nature. It is also interesting from the standpoint of operative interference for the relief of prolapse of the uterus.

Fig. 1.—Appearance of hernia when patient strained.

* From the Gynecological Service of the Cincinnati General Hospital.

1. Moschcowitz, A. V.: Surg., Gynec. & Obst. **28**: 514 (May) 1918.

REPORT OF CASE

History.—I. Y., aged 47, entered the gynecologic service of the Cincinnati General Hospital, Jan. 23, 1923, complaining of a rupture between the vagina and the rectum. She had been the subject of numerous operations, seven in all, only two of which had no direct bearing on her present illness. As a young girl she was compelled to work very hard and developed a prolapse. Her first operation, in January, 1899, was for the relief of this, by the vagina, without success. During the next two months she had two laparotomies for the same condition before it was improved. She was in bed three months after the last operation. In 1911, both tubes, ovaries and uterus were removed for the recurrence of prolapse. She then developed a bulging and protrusion of the vaginal walls, so that in 1912 the vagina was completely closed. The next two operations, in 1921 and 1922, were for umbilical and ventral hernias.

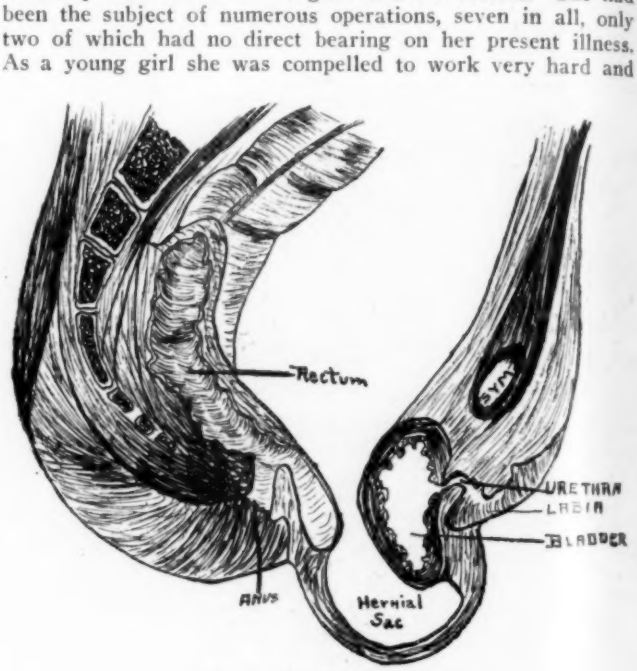

Fig. 2.—Relation of parts.

Aside from this, the history was negative. Menstruation had been normal. The patient had been married and had one child after the development of the prolapse.

Within about three weeks after closure of the vagina, she began to notice a bulging in front of the rectum which gradually increased in size, and became painful and larger on sneezing, coughing, straining and the like.

Examination.—The patient was well developed; the heart, lungs and abdomen were normal. Some bleeding which she reported in the stools was probably due to hemorrhoids. The Wassermann reaction was negative. Vaginal examination was impossible because all that remained of the vagina was a short, blind pouch. Rectal examination showed the pelvis to be empty. The perineal body was composed of nothing but skin, the center of which lay in wrinkles and was very loose in the recumbent position. By rectum this could be bulged out with the finger. When the patient coughed, a mass the size of a lemon protruded in the midline between the vagina and the rectum.

Operation and Result.—The patient was operated on, January 26, by Dr. Sigmar Stark. Tenaculum forceps were placed at the posterior end of each labium minus, and a third in the median line posterior to the hernial protrusion; the skin between was dissected back, disclosing a hernial sac. The bladder, attached low to the peritoneum of the culdesac which formed the hernial sac (Fig. 2), was separated by blunt dissection and brought to a higher elevation. The hernial sac was excised as high as possible, and in closure by transverse suture, complete obliteration of the culdesac was effected. The rectum was likewise freed from the hernial sac subsequently, and turned in behind the new perineum. The levator ani muscles with deep fascia on both sides were brought together in the midline, beginning in front of the

rectum and extending upward almost to the urethra with No. 2 chronic catgut. There were no complications or mishaps.

Recovery was uneventful except for a small area of superficial sloughing, which granulated in slowly, and can be seen in Figure 3. The patient was discharged from the hospital, March 1, much improved, with an excellent perineal body and no bulging.

Fig. 3.—Appearance on straining, two months after operation; small area of superficial sloughing in center, which was healing.

COMMENT

This case is cited not only for its interest as an unusual type of hernia but also for two other reasons: 1. To show the folly of doing a laparotomy for the relief of prolapse of the uterus without first performing a satisfactory plastic operation on the muscles and fascia of the perineum and pelvic diaphragm. 2. To show that by removal of a prolapsed uterus, descent of the vaginal walls, together with the bladder and rectum, is not prevented.

RUPTURE OF AN AORTIC ANEURYSM INTO THE SUPERIOR VENA CAVA

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Marsh 23, 1922, I was called to see a white man, aged 55, who presented such a unique group of physical signs that I deem them of enough significance to report. This case is not at all new, for many such have been described previously.

On a hunting trip, six months before, the patient had a cold followed by a cough, with considerable chest pain. Following his outing he felt weak and was easily exhausted, and the cough persisted. Since this time he had noticed some dyspnea on exertion, but had been able to carry on his work as a barber without any great difficulty, until five days before I saw him, when he was awakened suddenly at night with orthopnea. The following morning he noticed that his face was badly swollen and his skin was blue. These conditions had persisted, so that he was compelled to stay up; for when he lay down his head seemed too large and he was extremely cyanotic. He had been restless, walking round most of the time and being unable to sleep.

He had had measles and mumps as a child, and acute articular rheumatism at the age of 35. At 27 he had syphilis and gonorrhea. His weight in 1910 was 200 pounds (91 kg.), but was now 165 pounds (75 kg.).

His appearance bespoke heart trouble, yet it was different from any case that I had seen before. Although his legs and body, from his waist down, were not unduly fat, from his lower chest upward he seemed very large and extremely cyanotic. This apparent fat was in reality an edema, as could be easily determined when the skin was pinched, there being a distinct line of demarcation at the costal border. It seemed to increase in degree as one passed toward the head, the face being so swollen that the eyes peeked out of narrow slits as in acute nephritis, differing, however, in that there was no pallor. The lips, and particularly the ears, were extremely dark, and when the head was lowered they turned almost black. The pupils were irregular, and reacted slowly to light and in accommodation.

The neck was uniformly thick, not because of any glandular enlargement, and above the right clavicle there was a pulsating mass about the size of a hen's egg. The veins around the right shoulder were markedly dilated, as though there was an attempt at anastomosis. The arms and hands were markedly swollen and cyanotic. Just above the line of edema at the lower costal border, and extending round the entire chest, there was an area three-quarters inch wide of dilated capillaries, such as one often sees on the thigh in and around varicose veins. The whole precordium seemed to bulge with systole, but the point of maximum intensity of the heart was in the sixth interspace just outside the midclavicular line.

There was increased vocal fremitus, dulness, and increased conduction of breathing, voice, and whisper over both bases posteriorly. There was a marked widening of the cardiac dulness over the base, particularly toward the left, but also to the right of the sternum to such an extent that it measured

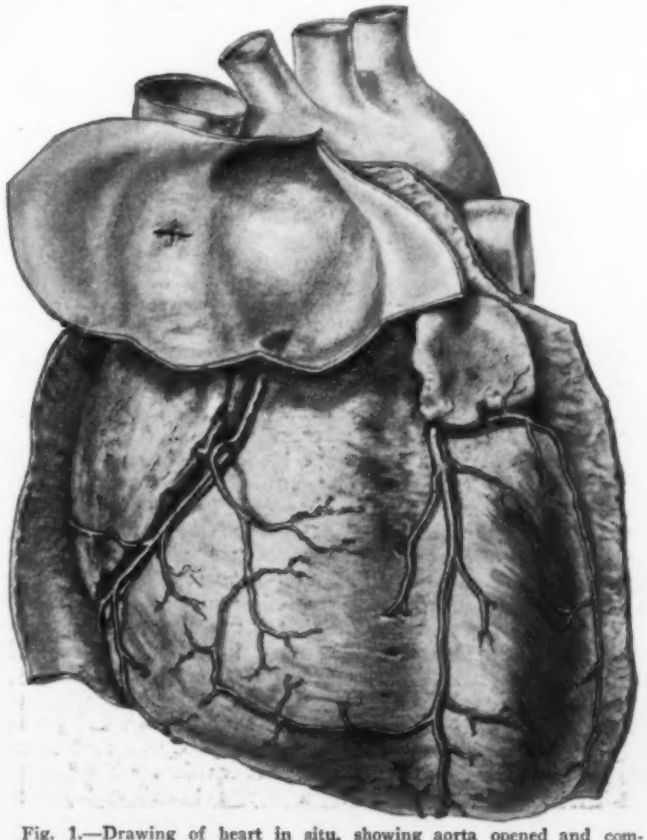


Fig. 1.—Drawing of heart in situ, showing aorta opened and communication into superior vena cava.

6 inches in the third interspace. The first sound on the left side of the heart was voluminous and followed by a systolic murmur. At this place, however, as well as all over the precordium, could be heard a bruit, both in systole and in diastole. This could be heard with greatest intensity in the second and third interspaces at the right of the sternum, and transmitted into the vessels of the neck, particularly into the

pulsating tumor above the right clavicle. The heart was regular.

Although the abdomen was well padded with fat, the lower edge of the liver was easily palpable three fingerbreadths below the costal border, and it was somewhat painful on pressure. The spleen was not palpable. There was a large right inguinal hernia. The lower limbs were devoid of edema. The knee jerks were absent, but the Babinski reflex was present to a slight degree on both sides. The blood pressure was 150 systolic, 0 diastolic. The urine was highly colored, and contained a small amount of albumin and a number of large, granular casts.

The patient was admitted to the University Hospital the same day. The temperature was normal; pulse, 102; respirations 28. The case was considered one of aortic aneurysm with increased mediastinal pressure and decompensation; accordingly, digitalis and morphin were administered. When I described the case to my senior, Dr. LeRoy Crummer, next day, he referred me to the case reports of rupture into the superior vena cava and, on reading the reports, one could not help but see the almost exact similarity of all these cases.

The electrocardiogram showed no apparent deviation from normal. The Wassermann reaction was four plus. The urinary output was 10 ounces during the first twenty-four hours. The roentgen-ray examination verified the large

Fig. 2.—Appearance of patient, semirecumbent.

aneurysmal dilatation of the aorta with mediastinal pressure, but, because of the serious condition of the patient, he could not be kept long enough for fluoroscopic examination.

His condition remained about the same, except that the attacks of dyspnea seemed to be getting a little more frequent, restlessness was more extreme, and increasing quantities of morphin were required for relief. On the fifth day the attacks of dyspnea were succeeded by short spells of irregular breathing, until he passed into coma, and death followed ten days after the rupture had apparently taken place.

A necropsy was not allowed, but permission was given to open the chest and examine the heart in situ. The depth of the structures rendered photography impossible; accordingly, a drawing (Fig. 1) was made. There was a considerable amount of clear fluid in both pleural cavities; this had probably accumulated since entrance to the hospital and since the roentgen-ray examination. The pericardium was adherent but easily separated, leaving a rough bread and butter appearance. There was no fluid. The aorta was enlarged to the size of a grapefruit, and the wall was thinned out so that it had the appearance of the auricle. When this was opened, as shown in the drawing, and the clots removed, there was found an irregular opening that would easily admit a lead pencil into the superior vena cava. The cava itself was much dilated upward, and projected to the pulsating mass above the clavicle. The heart itself was not opened or removed.

801 City National Bank Building.

A NEW ADJUSTABLE NASAL CLAMP

FOR IMMOBILIZATION OF FRACTURES OF THE NOSE, AND FOR POSTOPERATIVE CORRECTION OF EXTERNAL NASAL DEFORMITIES *

LUIS P. BERNE, M.D., NEW YORK

Immobilization is just as important for the ultimate success following operation for the correction of bony deformity of the nose, as it is in fracture of the long bones.

Fixation of the bony parts of the nose in proper alinement, or the application of either pressure or compression, is indispensable. This applies to the postoperative treatment of

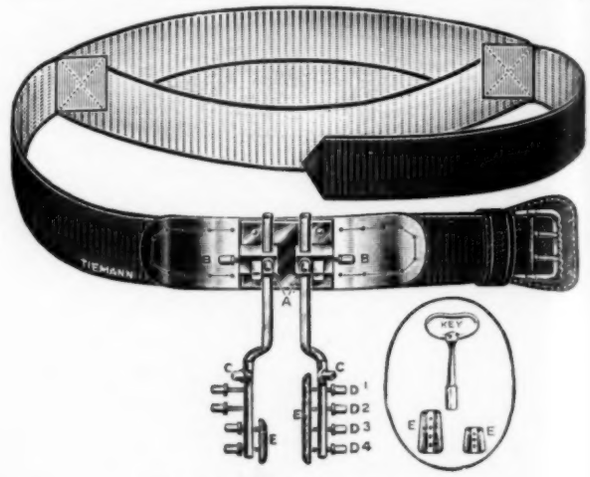


Fig. 1.—Adjustable nasal clamp.

traumatic fractures, and also following operations for the correction of external deformities when medial alinement or diminished width of the base is necessary.

The support here illustrated has been devised to meet all these requirements. It is adjustable to any nose.

Adjustment in an up and down, and an anteroposterior, direction is obtained by the screws *A* and *B* (Fig. 1) of the head band. Rotation of the lower half (nasal portion) into any position is accomplished by means of two rods which are controlled by the screws *C C*.

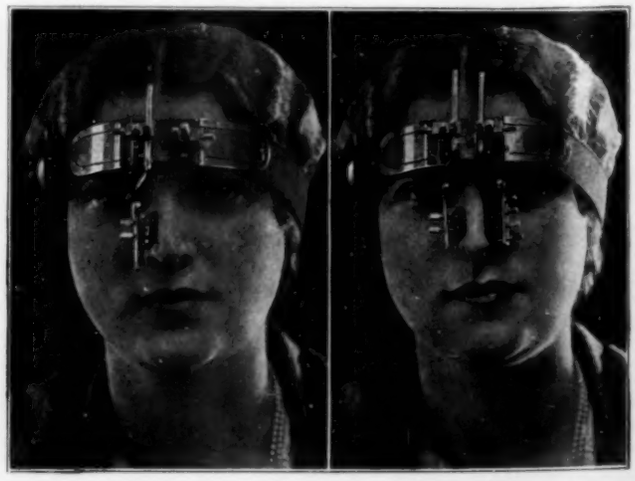


Fig. 2.—Use of clamp: *A*, when unilateral pressure and immobilization are required; *B*, when bilateral compression and immobilization are required.

Uniform pressure and compression in addition to immobilization are obtained by tightening the four screws *D* 1, 2, 3 and 4, of the nasal rods, when they are fitted into the cups of the respective plates *E*. The padded plates are obtainable in four sizes: 1, 2, 3 and 4.

353 West Eighty-Fifth Street.

* Instrument demonstrated before the New York Academy of Medicine, Feb. 28, 1923, the King's County Medical Society, March 22, 1923, and the Seventy-Fourth annual session of the American Medical Association, San Francisco, June, 1923.

ROENTGEN-RAY APPEARANCE IN A CASE OF CONGENITAL HYDROCEPHALUS

R. A. BARTHOLOMEW, M.D., ATLANTA, GA.

Associate Professor of Obstetrics and Clinical Gynecology, Emory University School of Medicine

Mrs. C. P., aged 26, white, primigravida, whose family, personal and menstrual history were negative, consulted me, Aug. 19, 1922, because of pregnancy. The last menstrual period had occurred, March 22, since which time there had been no show of blood. Nausea and vomiting had begun early in May, and continued moderately severe for about two months. Fetal movements had been noticed for the past several weeks.

The patient was fairly well nourished, weighed 120 pounds (54.4 kg.), and was of average height. There was no general adenopathy and the heart and lungs were normal. The blood pressure was 110 systolic, and 65 diastolic. The abdomen was normal except for the enlargement of the uterus, which extended several centimeters above the umbilicus. Fetal movements were distinctly seen. The measurements of the inlet indicated a moderately flat type of pelvis, the diagonal conjugate measuring 11.5 cm.; but the outlet was normal. A Wassermann test was not made, as there seemed to be no indication for it.

An abdominal examination, made October 27, at the end of the seventh month, showed the fundus slightly more than half the distance from the umbilicus to the ensiform cartilage; the presentation, left occipito-anterior, but nothing apparently abnormal on palpation of the fetal parts. The fetal heart rate was 135 a minute.

December 4, examination showed the fundus several centimeters below the ensiform cartilage, and the presentation, right occipitoposterior. The head was movable and felt abnormally large, but this was interpreted to be due to the fact that the fetus itself seemed to be larger than normal. December 13, another examination indicated that the head was disproportionately large. December 20, it was noted that the head felt not only extremely large but also distinctly cystic in consistency, strongly suggestive of hydrocephalus.

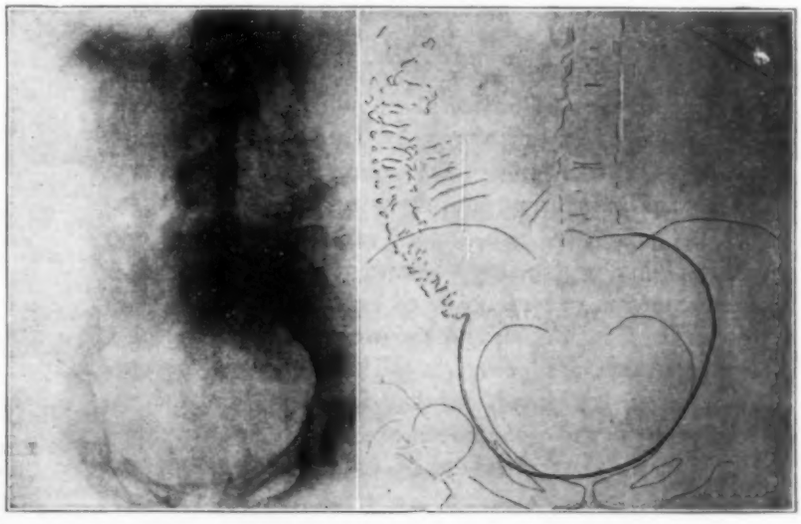
December 27, the patient was sent to Dr. J. J. Clark, who made a roentgen-ray examination of the abdomen. This examination showed extreme disproportion of the head to the pelvis, which he also thought was probably due to hydrocephalus. The presentation of the fetus continued to be right occipitoposterior and the head freely movable over the inlet.

The patient's blood pressure, urine and general condition had been normal on each examination; but, since she had reached full term, she was advised to take castor oil and quinin, which she did on the morning of Jan. 6, 1923. Early the following morning she had several labor pains and a premature rupture of the membranes, with escape of dark, greenish fluid.

Thereafter, from January 7 to January 12, daily observations showed the presentation to be right occipitoposterior, and auscultation of the fetal heart over a period of from five to ten minutes at each visit showed the rate to be persistently from 75 to 95 a minute, with occasional irregularity in rhythm. During this time the patient had no pains, and her general condition continued to be normal.

Labor began about 1 a. m., January 12, but throughout the day the pains were irregular, occurring at from five to fifteen minute intervals and of rather short duration. The presentation was right occipitoposterior, the head remaining freely movable and the fetal heart sounds slow, from 100 to 110 a minute. Rectal examination at 10 p. m. showed the head high up at a finger's length, freely movable, and the cervix about 6 cm. in diameter. At 11 p. m., after explaining the condition to the husband, and obtaining permission to perform a craniotomy, a vaginal examination was made. The cervix was found to be dilated about 7 cm.; and, bulging through the opening, could be felt a portion of the soft, cystic, movable head. The edges of the cranial bones could not be felt at any place within reach of the finger except behind the pubes. Counter pressure on the abdomen showed the head to be extremely large, verifying the diagnosis of hydrocephalus.

Under pretext of rupturing the membranes, a long pair of scissors was pushed through the scalp, releasing a very large amount of cerebral fluid. The scissors were directed into various portions of the head, and smaller accumulations of fluid emptied, assisted by pressure on the head through the abdominal wall. The head decreased rapidly in size, crepitation of the cranial bones being distinctly felt, and the fluid became bloodtinged from the severing of cerebral vessels. The fetal heart sounds ceased within five minutes after the craniotomy was done, and within ten minutes the labor pains, which previously had been irregular, infrequent and weak, became regular and severe at from two to three minute intervals. The baby was delivered, stillborn, January 13, at 12:55 a. m. The placenta was expressed complete about twenty minutes later, and showed no anomalies. A slight second degree laceration of the perineum was repaired before the patient reacted from the anesthetic.



Hydrocephalus at ninth month of pregnancy; at right, traced outline.

The baby was a boy, weighing 8½ pounds (3.8 kg.) exclusive of the fluid lost from the head. The head was typically hydrocephalic, showing very wide sutures and fontanels; when it was filled with water, the occipitofrontal circumference was 52 cm. The spinal column showed a spina bifida involving the lower eight dorsal vertebrae, and the left foot was clubbed.

A necropsy was not performed.

On closer, subsequent examination of the roentgen-ray film, the evidence of spina bifida could be seen quite distinctly, although it had escaped observation on first examination. The patient had an uneventful convalescence.

COMMENT

Points of interest in connection with this case are the corroborative evidence offered by the roentgen-ray examination, the outline of this head being distinctly greater than that of any of the cases studied in connection with the colored maternity service at the Grady Hospital; also, the unusually slow fetal heart rate during the week preceding labor and during labor itself. This phenomenon may possibly be explained by vagus stimulation resulting from the marked increase in intracranial tension in hydrocephalus. In cases suspected or diagnosed preceding birth, it would be of particular interest to note whether fetal bradycardia is characteristic of hydrocephalus.

20 Ponce de Leon Avenue.

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SATURDAY, DECEMBER 1, 1923

PROBLEMS OF LIFE IN THE TROPICS

The various physiologic problems concerned with life in the tropics have assumed an increasing importance in recent years. The penetration of civilized man into "the remotest corners of the earth" has brought persons, adapted through generation after generation to the climatic peculiarities of the temperate zones, into new conditions of environment. The white races are being transported, through the exigencies of commerce and colonial expansion, into domains inhabited almost exclusively by the black-skinned races. The question of the ability of the newcomer to withstand the new environment is one of no small moment in the readjustments of population and the evolution in industrial expansion that are going on. The indigenous races are likewise concerned, in that for them, too, new social and economic conditions are certain to alter the traditional habits and modes of living.

The need of information about the situations thus being created has been appreciated more deeply in this country ever since our occupation of the Philippines. Some of the European governments have faced the paucity of dependable information in an official way much longer. Yet the last quarter century, which has witnessed so many important discoveries in science, cannot be said to have advanced our understanding of physiology in the tropics greatly, although it has improved the sanitary conditions in tropical and semitropical zones, and enriched our knowledge of tropical medicine. Indeed, it almost seems as if the mastery of disease in the tropics has been more successful than the mastery of normal living in these regions.

There are, however, some positive contributions. As Breinl has pointed out, for life in the tropics the physiologic response of the warm blooded animal organism to the increased external temperature is of the greatest practical interest and importance. Under normal conditions, the temperature equilibrium is maintained by heat production and heat loss; the former is brought about by chemical means—by the combustion of food material in the body; the latter, by physical means—by radiation and convection and by evaporation of sweat. Radiation and convections, however, exercise a comparatively unimportant part in the heat-regulating mechanism of the clothed human being in the tropics, where the outer temperature is high and frequently approaches that of the body; under these conditions the human organism relies for its cooling mainly on the heat loss due to the evaporation of sweat. Humidity is a factor interfering more or less with the latter process; and there are regions of tropical heat in which the atmospheric moisture as well as the temperature is exceptionally high. For such places, in particular, the problem of the tolerance of personal discomfort, particularly when work increases the heat production of the body under conditions of imposed loss, has been much debated. Haldane's [1] studies have indicated that the temperature of the human organism exposed to humid heat begins to rise after a period varying according to the individual and the conditions, and then continues to do so. The rise in body temperature corresponds with the reading of the wet bulb temperature, and is virtually independent of the dry bulb temperature. During rest in still air, wet bulb temperature of about 31.1 C. (88 F.) could be borne without any abnormal rise in rectal temperature; but when the thermometer rose above that temperature, the rectal temperature immediately began to rise, being accompanied by an increase in the pulse rate, profuse sweating and dyspnea, until finally exhaustion set in. During muscular exercise in still air, this increase in body temperature began at a lower wet bulb reading (27 C., or 80.6 F.), while in moving air much higher wet bulb temperatures were required to produce the same effect. Breinl's [2] observations, carried out on a large scale on laborers in North Queensland, Australia, under supposedly severe conditions of humid heat, are in harmony with laboratory studies in showing remarkably good powers of adjustment. Even when the wet bulb themometer reached 30 C. (86 F.), the averages for rectal temperatures were only between 37.7 and 38.3 C. (99.9 and 100.9 F.), with a maximum of 38.8 C. (101.8 F.) and a minimum of 37.5 C. (99.5 F.). The heat regulating mechanism of the laborer was not severely affected, and he was still able to maintain a temperature equilibrium, although at a somewhat higher level.

The extreme views broadcast by certain writers about the severe effects of sunlight in the tropics have also proved to be untenable. The greater intensity of the rays is due solely to the less oblique path of the rays striking the earth, whereby they have passed through a smaller layer of atmosphere. As a result, a lower degree of absorption and scattering has taken place, and the chemical and physical activities of these

1. Haldane, J. S.: J. Hyg. **5**: 494, 1905.
2. Breinl, A.: An Inquiry into the Effect of High Wet Bulb Temperatures upon the Pulse Rate, Rectal Temperature, Skin-Shirt Temperature and Blood Pressure of Wharf Labourers in North Queensland, M. J. Australia, April 16, 1921.

rays are therefore greater, the nearer to the equator. This greater activity of the sun's rays manifests itself in every-day life; but as yet there are no really cogent reasons for believing that any ill effects of the tropical sun are due to light rather than heat, however interesting the speculations about direct insolation may be. The truth is that we are still largely ignorant of the fundamental facts on which to base final judgments. Heat regulation, basal metabolism, and circulatory and hematopoietic functions appear to remain unimpaired under suitable conditions of living. Even the alleged neurasthenia of tropical residents may be somewhat of a myth. What is needed today is more fundamental investigation, the sifting of fact from fancy, in order to ascertain whether, in truth, tropical regions militate against successful invasion by persons who have been adjusted to other environments.

THE DISCOVERER OF THE BABCOCK TEST FOR MILK FAT

Sherman has reminded us that "milk is the one article of diet whose sole function in nature is to serve as food." Its importance accordingly assumes enormous proportions. The milk consumed as such in the United States is estimated to approximate one third quart (liter) per person daily, in addition to which a much larger quantity is used for the manufacture of cheese and butter that also enter the dietary of man. To those who are impressed more forcibly by a dollars-and-cents evaluation of the subject, it may be interesting to learn that the milk industry involves the equivalent of more than half a billion dollars annually. Of course, the importance of this business to our population is far greater than its money value can indicate. No other food is more vital to national health and efficiency. It takes a preeminent place in the nourishment of the young, and it furnishes an incomparable source of nutriment in the dietary of the sick and the convalescent.

A product of this sort must obviously be safeguarded against dangerous contamination; hence the institution of systems of efficient inspection and other precautions designed to insure milk sanitation and a safe milk supply. But, obviously, milk has offered a ready opportunity for adulterations that reduce or impair its nutritive value rather than render it likely to transmit infection. Since the milk fat or cream element is the most valuable component of the fluid, it has been singularly liable to dilution or removal; while, furthermore, the energy value of the milk varies largely with its comparative richness in the fats. Between skimmed milk and the richest Jersey or Guernsey milk there is a wide latitude of fat content; and the determination of the latter is often particularly desirable in modifying a diet into which milk enters largely.

Thanks to an invention of an American chemist, Prof. S. M. Babcock of the University of Wisconsin, a rapid, simple method for the accurate estimation of the fats in milk was made available in 1890. The announcement spread rapidly throughout the entire dairy world, and apparatus for the familiar "Babcock test" for milk was introduced not only into chemical laboratories but sooner or later into every creamery in the smallest hamlet. The importance of the Babcock test to every institution or individual concerned with milk can scarcely be exaggerated. It was enhanced by the fact that the scientist gave his invention freely for public use without exercising the lucrative rights that a patent would have secured for him. March 27, 1901, a medal was given to Dr. Babcock by the state of Wisconsin, bearing the inscription, "In recognition of the great value to the people of this state and to the whole world of the invention and discoveries of Prof. Stephen Moulton Babcock of the University of Wisconsin and his unselfish dedication of these inventions to the public service, the state of Wisconsin presents to Professor Babcock this medal." The medical profession joins in the felicitations that are being extended to Professor Babcock at this season in celebration of his eightieth birthday anniversary.

THE RELATIVE VALUES OF FATS

Most of our readers will recall the expression, "Fat is fuel for the fighters," a slogan made familiar throughout this country by the billboard appeals of war time. Before 1914, the use of fats in this country was probably more generous than that of any other country. Whereas the American ordinarily consumed 3½ ounces a day, the Englishman used 3⅛, the German 2⅓, and the Frenchman 1½ ounces. Following the progress of international hostilities, these figures changed greatly for the European countries. The fats obtained from domestic animals (butter, lard, suet and tallow, for example) were produced in much smaller amounts than usual, on account of lack of food for the stock obtainable from abroad. The vegetable fats and oils are made chiefly from the seeds of plants growing in warm countries (olive, cottonseed, peanut), and these could not be imported as usual for lack of ships. To make the situation worse, fats were needed not only for food but also for making glycerol and other compounds used for munitions and for various other industrial purposes, including the manufacture of soap.

From the standpoint of governmental needs, the situation as regards the fat supply in 1917-1918 made necessary both an actual cutting down of consumption and a substitution of one kind of fat for another—the vegetable oils for the animal fats. This was not difficult, for the possible substitutes were numerous and fairly familiar. Aside from butter substitutes such as oleomargarin and nut or vegetable margarins made from coconut, cottonseed and peanut oils, lard substitutes represented by mixtures of vegetable oils with harder animal fats and hydrogenated oils—fats made solid by

passing hydrogen through them under proper conditions —came into legitimate prominence, though they had been available long before.

It was quite natural that pronounced changes in the dietary habits and traditions of a country should awaken some misgivings as to both the desirability and the physiologic wisdom of the substitutions. The urge of patriotic sacrifices in the direction of saving fats is no longer with us, so that inquiry as to the nutritive values of some of the newer products is pertinent. That the subject is one of interest to the medical profession is attested through inquiries received by THE JOURNAL regarding the relative digestibility and utilization of animal and vegetable fats in particular. The government laboratories have anticipated the demand for information by investigations of at least fifty more or less common fats and oils.[1] The outcome seems to indicate that the digestibility coefficient of the fats having melting points above body temperature (37 C., or 98.4 F.) varies inversely with the melting point. It has also been found that most of the common oils are utilized from 93 to 98 per cent. by the human body. Nevertheless, some oils were found to cause digestive disturbances, and some oils are less tolerated by the body than others. Therefore, before we can say whether or not an oil or a fat is suitable for use in the human dietary, we must know not only its coefficient of digestibility but also its effect on the human body when eaten in quantities at least equal to those in which butter or other common fat is used in the average dietary.

The true fats, that is, the glycerids of fatty acids, are primarily sources of energy for the organism, and from this standpoint they have approximately equal value, their availability being determined essentially by texture and consequent ease of digestion. The factors that determine a choice include relative cost, suitability for special culinary uses, palatability and traditional preferences. A large number of investigations indicate that the digestibility of the other ingredients of the ration is not essentially altered by the character of the fat included with them. By careful regulation of the processes used, it is possible to "harden" oils by hydrogenation so that the products have any desired melting point. The result of studies in various American laboratories [2] lead to the conclusion that these hardened oils are utilized as well as natural fats of corresponding melting points. Of course, there are pathologic conditions, particularly those involving the failure of biliary and pancreatic secretions, which place limitations on the digestibility and absorption of any sort of fat.

More important than these features of digestibility is the fact that naturally occurring fats may be "carriers" of nutritive values or potencies not expressed in terms of energy. They may contain more or less fat-soluble vitamin A and antirachitic substance. These cannot be neglected. They are present far more richly in fats of animal origin than in those from vegetable sources. Green vegetables also contain vitamin A, so that the dietary is not dependent solely on animal fats for a supply. The vitamin content has come into prominence as an important consideration in all questions of nutrition. The dietitian, however, should distinguish clearly between fats as adequate sources of energy and fats as carriers of vitamins. The two features need not be identified in a single item, nor does the absence of one necessarily vitiate the value of the other. The wholesomeness of a fat is not determined primarily by its vitamin content, though the choice of fats for individual uses may be guided at times by such a consideration.

After all, one should recall that fats and oils are much alike in chemical composition and properties. The kinds that different nations have eaten have depended chiefly on climatic and economic conditions. Thus, olive and coconut oil are used in tropical and semitropical countries; lard and butter, in meat producing countries. In recent years, with the development of industries and transportation, the variety, especially of the vegetable products, has been largely extended.

The fact that some fats are solid and some oily does not affect their comparative wholesomeness, but it does make a practical difference in the way we use them. Sicilian peasants may enjoy eating olive oil with their bread, but most Americans prefer a stiffer "spread." The conclusions issued by the U. S. Food Administration during the war remain cogent today: Except for the vitamin present, there is no difference in the food value of different kinds of fat. All yield equal amounts of energy, and are digested with virtually the same ease and completeness. Scorched fats, such as are found in foods that have been fried at too high a temperature, sometimes prove troublesome and have given fried foods the reputation of being indigestible; but this is probably due to the poor cooking rather than to the fat itself. Although fats do not usually cause any digestive disturbances, they do remain in the stomach longer than the other nutrients, and this seems to have a most interesting effect on the sensation of hunger. That sensation begins to be felt after the stomach has been empty for a time. If there is little or no fat in the meal, the sensation begins more quickly, and this probably explains why a diet poor in fat seems so unsatisfying and why one rich in fat seems "hearty." Fat in the diet has a marked "psychologic" value. Food without fat is likely to be without flavor and monotonous. If a food is distinctly unpleasant and different from that to which a person is accustomed, actual digestive upset may result. However, all the more recent investigations indicate that the margin between the amount and kinds of fat we may desire and that which we actually need is wide beyond expectation.

1. Langworthy, C. F., and Holmes, A. D.: Bull. 310, 1915; Bull. 505, 1917; Bull. 507, 1917, U. S. Agric. Dept. Holmes, A. D.: Bull. 613, 1919; Bull. 630, 1918; Bull. 687, 1918; Bull. 781, 1919, U. S. Agric. Dept.

2. Holmes, A. D., and Deuel, H. J., Jr.: Digestibility of Some Hydrogenated Oils, Am. J. Physiol. **54**: 479 (Jan.) 1921.

Current Comment

EXERCISE AND THE CIRCULATION

One of the immediate effects of muscular exercise is the acceleration of the heart beat. Even with a comparatively slight performance, the pulse rate of an adult may rise to 100 a minute; when the work done is heavier, the figure may exceed 150. Under such conditions it is evident that profound changes must be produced in the circulation, indirectly influencing all the tissues of the organism. It is commonly believed that the capabilities of the circulation form the foremost limiting factor in the ability of the organism to engage in strenuous muscular performance. As the working structures demand an uninterrupted supply of the indispensable oxygen, which can reach them only through the blood stream, it becomes apparent that the circulation must have a significant part in maintaining an adequate available quota. Recent experiments by Himwich and Barr [1] leave little doubt that, contrary to what one might expect in times of demand, not only the oxygen capacity but also the oxygen content of the blood is usually augmented during and after short periods of vigorous work. Consequently, no part of the hyperpnea attending ordinary exertion can be attributed to an anoxemia—a lack of oxygen in the arterial blood—although after severe and exhausting exercise such a factor may come into play. The mobilization of red corpuscles with their oxygen-carrying hemoglobin, the stretching of the alveolar membranes through the more vigorous breathing, and the consequent better diffusion into the lung, all contribute to enable the blood to retain more oxygen. Indeed, the investigations of Himwich and Barr lead them to the unanticipated conclusion that perhaps the severity of the exercise that a normal person will tolerate may be determined by the amount of oxygen that can diffuse through the lung membrane rather than by the capabilities of the circulation.

BACTERIOLOGIC DIAGNOSIS OF CHANCROIDAL INFECTION

While our knowledge concerning venereal diseases in general has grown rapidly in recent years, we lack a ready and reliable means for making a bacteriologic diagnosis in chancroidal infections. The causative agent in chancroidal infections is the bacillus of Unna-Ducrey, which can be demonstrated in ordinary smear preparations by means of the Gram stain, the organism retaining the counterstain. Chancroidal infection, however, is often mixed with syphilitic infection, and in such cases differential diagnosis of the two infections may be difficult, if not impossible, unless a complete examination of smear and dark-field preparations is made. Haxthausen [2] states that of cases diagnosed as chancroidal infection, and treated by specialists as such, eighteen in three hundred presented symptoms of syphilis later. While it is nearly thirty years since Unna and Ducrey described the bacillus of chancroid, no practical method of cultivating the organism that may be used in diagnosis has been introduced. Recently, Teague and Deibert [3] described what seems a simple means of growing the organism in culture for diagnosis, by inoculating pus directly from the chancroid into tubes of sterile clotted rabbit blood heated to 55 C. for five minutes. After incubation for twenty-four hours, smears from the exuded serum may show characteristic chains of gram-negative streptobacilli, associated frequently with gram-positive organisms. Teague and Deibert obtained positive cultures of the bacillus of Unna-Ducrey in 50 per cent. of all venereal ulcers examined, most of the negative cultures being obtained in cases clearly not chancroidal in character. They conclude that a cultural diagnosis of chancroid may be obtained in a large proportion of cases, probably about 90 per cent. In order to perpetuate cultures obtained in the way described, Teague and Deibert transplanted the colonies into clotted rabbit blood heated at 55 C. for fifteen minutes, incubating for twenty-four hours and then preserving the culture in the refrigerator. Such cultures may remain alive at least three and sometimes four or more weeks. They studied a large number of pure cultures with special reference to serologic classification, but apparently without obtaining any indication that the bacillus falls into definite groupings. The method described by Teague and Deibert seems to be a relatively simple procedure, but it probably will require a great deal of further investigation in the hands of competent observers before its real practical value may be definitely established. If it should prove successful, it will mean a real advance in the diagnosis of chancroidal infection.

CLINICAL INVESTIGATION ON PRIVATE PATIENTS

> The cases whose metabolism is here recorded have been private patients of the writer. . . . The experiments were performed *with* the patients rather than *upon* them. . . . The investigators and the patients considered themselves united in a partnership, having for its object the accumulation of knowledge for the benefit of all diabetics rather than for the given individual under investigation in particular. . . . These statements . . . demonstrate, first, that private patients are especially desirable subjects for scientific investigation; and, secondly, cooperation and an intelligent understanding of what is the purport of an experiment considerably lessen the labor of supervision and are of the greatest assistance in preventing errors, whether wilful or unintentional.

This paragraph, from the introduction to Joslin's [4] new volume on diabetic metabolism, calls attention to a partnership which has thrown much light on hitherto dark problems of diabetes. To perform the experiments requires intelligence and cooperation. Joslin secured the cooperation of his intelligent patients, and as a result all diabetic patients will receive the benefit of the investigations. Other workers in clinical medicine have used similar methods. Much of Mackenzie's work on heart disease was done in private practice; the history of gout is filled with studies of the disease

1. Himwich, H. E., and Barr, D. P.: Studies in the Physiology of Muscular Exercise, V, Oxygen Relationships in the Arterial Blood, J. Biol. Chem. **57**: 363 (Sept.) 1923.
2. Haxthausen: Hospitalstid. **66**: 489 (July 11) 1923.
3. Teague, O., and Deibert, O.: J. M. Res. **43**: 61 (Jan.-March) 1922; J. Urol. **4**: 543, 1922.
4. Joslin, E. P.: Diabetic Metabolism with High and Low Diets, the Carnegie Institution of Washington, 1923.

often made by the observer on himself. Sydenham, Harvey and Hunter contributed valuable observations on the disease as it affected themselves. Yet Joslin's study is probably the first that stresses the importance of working with the more intelligent private patient in laboratory experiments. Frequently, much fear has been felt that intensive investigation of a disease was not good for the welfare of the more highly strung private patient. As a result, small hospitals with no community (charity) service have not felt the urge of advancing medical science, and large hospitals have too often used only their ward services for investigation purposes. Physicians, in practice, experiment every time they give a dose of a drug or, in fact, therapy of any kind, for patients differ in their reactions to substances that may be administered. How much better to recognize this factor and then to carry the thought to its logical conclusion. Every patient requires study; study is synonymous with the desire for truth, and truth is the basis of any possible development. Private patients may be allowed to appreciate these facts, and when they do, are usually eager to participate in the honor and the glory of the work.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

University News.—Governor McRae in a speech at a banquet of the students and faculty of the University of Arkansas Medical Department, Little Rock, November 12, promised new buildings for the medical school as part of his general tax program for the relief of all public schools in the state. The enrolment has practically doubled during the last year and lack of room for further expansion makes new buildings necessary. Extra hospital facilities are part of the program. Steps were taken at this meeting toward the erection of a memorial to the physicians of Arkansas who lost their lives during the World War.

CONNECTICUT

Connecticut's Part in the Diploma-Mill Scandal.—According to the reports, a special grand jury has been created in Connecticut for the further investigation of the serious part which Connecticut has had in the recently exposed diploma-mill activities. According to the news comments these activities appear to center in the Connecticut Eclectic Examining Board. Reports state also that the Eclectic Board has attempted to transfer a part of the blame on the Connecticut state health department. In reply, Dr. Stanley H. Osborn, state health commissioner, stated that "the law makes it obligatory on the part of the health department to issue licenses to all who have been passed by the (three separate) examining boards." He explained that the "capacity of the state department of health with relation to the eclectic examining board was little more than that of a clerk." "In order to revoke the licenses of any eclectic physicians," Dr. Osborn said, "written requests to that effect must be received from every member of the eclectic examining board." He stated also that Section 2857 of the General Statutes required that "every applicant for (medical) examination shall be examined by the committee representing the same school of practice in which the applicant was graduated." Dr. Osborn showed that Connecticut Eclectic Examining Board had not limited itself to graduates of eclectic colleges as prescribed by law, but accepted for examination almost any medical graduate who presented himself.

Laxity and carelessness in the issuing of medical licenses on the part of the Eclectic Board as referred to in the news reports, is illustrated by the following letter, a photographic copy of which was reproduced in several newspapers. This letter is alleged to have been written by Dr. Frank Webb of Bridgeport, Conn., and is said to be an important part of the evidence in the investigation.

Frank Webb, M.D.
1670 Iraniston Ave.
Phone Barnum 1205

Bridgeport, Conn., Dec. 11, 1922.

H. G. Heller, M.D.

Dear Doctor:—I am sorry to say that you did not pass you failed on Chemistry. I went up to Durham to Dr. Markham and tried to get him to mark you; but he showed me your papers and we could not twist them around so they could conform to law. Are you registered in Arkansas if not take the eclectic board there and then get reciprocity with us, as we want you here particularly myself as you know. One of the doctors got 97 7/10 in chemistry. Personally I think it is about time that old Ernest Markham was off the board and I think that I will drop him when his term expires which is in 2 years. With kindest regards and regrets that you will be delayed in coming to our state I am,

Fraternally yours,

Frank Webb, M.D.

P. S. Can you send me Dr. White's address? Write soon to your friends.

F. Webb.

Under the caption "The Eclectics Take a Purge," an editorial in the Bridgeport (Conn.) *Telegram* refers to the situation as follows:

The Eclectic society in Bridgeport yesterday made a beginning toward purging itself by withdrawing its endorsement of Dr. James Christian for membership on the eclectic examining board. But why did they ever endorse a man who, on his own first attempt, could not pass a board even so lenient and broad-minded in its outlook on "doctors"?

The situation into which the State of Connecticut has gotten itself by laxity and carelessness in the issuance of medical licenses is illustrated by the fact that but for the timely newspaper exposure, the Kansas "diploma-mill" might be sending its young men into Connecticut by the carload, with a number of its own "graduates" sitting on the examining board and passing them through as fast as they came!

It is all very well for the eclectic examining board to point out that the state board of health is not without its responsibility in this matter. The state board has only a perfunctory scrutiny of applications for medical licenses. But there is no gainsaying the fact that when the fakers came into Connecticut to get medical licenses they always, somehow, gravitated before the eclectic board for their examinations and never anywhere else. And that fact is enough to condemn the eclectic board and its methods in the minds of any intelligent person.

The Connecticut Chamber of Commerce is said to be taking steps looking toward the improvement of their laws regulating medical practice in that state. Revisions are contemplated to bring about a higher standard and a more rigid regulation of medical practice with a view to safeguarding the people of the state against illiterate and incompetent doctors. The Chamber of Commerce aims to secure these improvements by independent action, states the report, inasmuch as "repeated efforts of reputable physicians before the General Assembly have failed to secure satisfactory regulations" for the very reason that "inferior and quack doctors have always raised the cry that such movements were governed by selfish motives."

The Diploma Inquiry Continued.—The first result of the special grand jury investigation of the "diploma mill" was that all physicians in Connecticut claiming graduation from the St. Louis College of Physicians and Surgeons are said to have had their licenses revoked by the state department of health, November 22, on recommendation of the grand jury. It was disclosed that special cars were used by Dr. Robert Adcox and Dr. D. R. Alexander to bring recruits to Connecticut for their "medical examinations." Four trips east were made each year and the candidates for doctors "shingles" included barbers, drug clerks, carpenters, soda dispensers, plumbers, automobile mechanics and traffic cops. A phonograph was provided for entertainment and the questions (obtained in advance) were "rehearsed" on the train. Further investigation by the grand jury showed that fake diplomas have been issued from fifteen alleged medical schools in the country in which are included, it is stated, the Eastern University School of Medicine (later the Maryland College of Eclectic Medicine and Surgery), Baltimore; the Oriental College, Washington, D. C., of which Dr. H. P. Holler is dean, and where, it is said, more degrees have been offered than there are on the thermometer, and the Atlanta Eclectic Medical College, Atlanta, Ga. [We have no college listed under this name.—ED.] Investigation will be made of diplomas issued by these institutions. Evidence bearing on the activities of the Naturopathic Health School, 759 East Thirty-Seventh Street, Chicago, showed that this school advertised its course for $36 and issued literature which stated: "Unbelievable as it may seem this school actually instructs how by simple scientific procedure to restore many classes of dead persons to life." Investigators say there are many graduates

of this school in New York as well as numerous students of the National College of Chiropractic, Grand Rapids, Mich., which, it is reported, offers a diploma for a correspondence course in chiropractic at $15. Another fact brought out in this investigation was that a circular letter was sent out last spring, with Dr. James A. Christian's name attached, asking recipients of "diplomas" for $125 each for a proposed $35,000 "slush" fund with which to get the state legislature to protect the licenses issued. Governor Templeton has asked Mr. Alcorn to inquire into the authenticity of foreign medical school diplomas also on which many foreign born physicians now in the state have been admitted to practice. Professor Sachs who voluntarily came from St. Louis as a witness has promised to give the names of 1,000 quacks and also the names of regularly licensed physicians of New York, Boston and Chicago, who for a money consideration, it is reported, took medical examinations in Connecticut for the quacks. Evidence was presented pointing to the existence of a well organized reference bureau from which references could be obtained in addition to actual state licenses which would give the holders of fake credentials admission to recognized institutions. Subpenas have been issued for Achilles and James Demarco of New York, who, it is alleged, obtained medical diplomas through Dr. Adcox which enabled recipients of purchased credentials to obtain licenses to practice in New York. It was stated that the Demarcos were given what is tantamount to the exclusive privilege of supplying "doctors" to New York. A warrant was issued for Dr. George E. Sutcliffe on a charge of manslaughter following evidence that during his five months practice in Farmington, six of his patients had died. Dr. Edwin M. Ripley, who sold his practice to Dr. Sutcliffe, has been removed as medical examiner for Farmington after holding office sixteen years. Dr. James W. Cottner, another graduate of the Kansas City School of Medicine and Surgery has also been removed as school physician at Stratford.

ILLINOIS

Chicago

Pasteur Lecture.—The Pasteur Lecture was delivered by Dr. Otto Folin of Harvard University Medical School, Boston, November 23, before the Institute of Medicine of Chicago at the City Club. His subject was "What We Have Learned About Uric Acid."

Society News.—A joint meeting of the Chicago Laryngological and Otological Society and the Chicago Neurological Society will be held, December 3, at the Auditorium Hotel. Following the fellowship dinner a symposium will be held on "Relation of Diseases of Ear, Nose and Throat and Inflammatory Diseases of the Brain and Meninges."

Birth Control Clinic in Court.—A decision by Circuit Court Judge Fisher, November 23, commanded the city to issue a license for a birth control clinic in Chicago. The judge ordered a writ of mandamus directed against the mayor of the city and the city health commissioner. It is stated that an appeal will be taken from the decision. It is reported that quarters for what is termed the "Parents' Clinic" have been established at 1347 North Lincoln Street and equipped at private expense.

Cultists Refused Clinic Tickets.—A committee was recently appointed by the Chicago Medical Society to interview members of the Cook County Board to ask that the custom now in vogue of permitting cults to buy tickets admitting them to the clinic services of the Cook County Hospital, Chicago, be discontinued. The committee of physicians appeared before the public service committee, and the president of the board offered a motion that the practice be abolished. The motion was passed unanimously by the fifteen commissioners present.

Illegal Practitioners Arrested.—According to reports, Juan Derrick, under indictment by the grand jury, is being held on two charges: forgery of the name of Dr. James M. Hall of Chicago, and practicing medicine without a license.——Eugene Kuhne, president of the Biofood Corporation, was arrested, November 23, by John W. Follmer, state inspector for the department of registration and education, on a charge of operating a "cure-all" medicine business in violation of the medical practice act. Kuhne's Biofood literature "guarantees" to cure nineteen different ailments, it is stated.

Personal.—Dr. Otto L. Schmidt was elected president of the Chicago Historical Society at the sixty-seventh annual meeting, November 20.——Prof. W. Lee Lewis, Evanston, Ill., head of the department of chemistry, Northwestern University, has been appointed director of scientific research for the Institute of American Meat Packers with headquarters in Chicago.——Drs. Don C. Sutton, Frederick G. Dyas, Edwin P. Ziesler, Frank J. Novak, Frederick Mueller, Louis Bothman and Samuel M. Feinberg have been appointed to the staff of the Frances E. Willard National Temperance Hospital.

Outbreak of Typhoid Fever.—In the district bounded by Twenty-Ninth Street on the north, Seventy-Ninth Street on the south and Lake Michigan and South Halsted Street, nearly one hundred cases of typhoid have appeared within the last week with two deaths, it is reported.——Forty-six stores in Evanston, Wilmette, Kenilworth, Winnetka, Glencoe and Highland Park have been ordered by the health authorities to cease handling or selling a certain brand of oysters, to which, it is claimed, the north shore typhoid epidemic has been traced. It was found that every one of the patients in Evanston had eaten the same brand of oysters shortly before taken sick. Nearly thirty cases have been reported along the north shore.

Free Dental Clinic.—The children's new free dental clinic at the Cook County Hospital was formally dedicated, November 21, with nearly 4,000 dentists, county officials and child welfare workers in attendance. Don M. Gallie, D.D.S., presided. This is the first clinic in Chicago to provide free dental treatment for children, it is said. It comprises seven dental service outfits, an examination room, a surgical room and a roentgen-ray department. Children are selected for treatment by physicians at the Cook County Hospital, the juvenile court, the county agent and the bureau of social service. Dr. Arthur D. Black, dean of Northwestern University Dental School, stated that plans are being made to establish a free clinic for adults and to enlarge the children's clinic.

INDIANA

License to Practice Refused.—The state board of medical registration and examination has refused Adolph Tixler, Gary, permission to practice medicine in Indiana permanently, it is reported. Tixler was once given a temporary permit to practice but it was suspended last summer, when the board was informed that he had been discharged from the United States Army after a court martial. Tixler had continued practicing, it is stated, in violation of the law after his temporary permit was suspended.

IOWA

Hospital News.—The superintendent of the University Hospital of the State University of Iowa Medical School, Iowa City, announces the opening of an annex to be given over solely to the care and treatment of diabetes cases. ——The new Samaritan Hospital Association recently voted to continue operation of the institution at Sioux City, instead of merging it with another hospital.

MARYLAND

De Lamar Lectures.—Prof. Friedrich Fülleborn of the School of Tropical Medicine, Hamburg, Germany, delivered a lecture on "Filariasis" as one of the de Lamar lectures in hygiene, at the School of Hygiene and Public Health, Johns Hopkins University, November 26.

Meeting of Book and Journal Club.—The Book and Journal Club, of the Medical and Chirurgical Faculty, met November 20, in Osler Hall. Charles Stevens of Baltimore gave an illustrated lecture on "Pioneers of Medicine." There was also a loan exhibition of pictures, books and instruments. Dr. William H. Welch presented the Frederick Wiesenthal coat of arms to the faculty, which, the gift of John Milton Griffith, was brought to this country from Prussia by Dr. Wiesenthal.

MASSACHUSETTS

Clinical and Surgical Association.—A delegation of members of the Massachusetts Clinical and Surgical Association were the guests at Fall River, November 14, of Dr. Philemon E. Truesdale at his new hospital.

MINNESOTA

Diphtheria Closes Schools.—The schools and churches of Preston have been closed by the health officer to prevent an epidemic of diphtheria.

Personal.—Drs. Christian L. Roholt, Waverly, and John J. Catlin, Buffalo, were elected president and secretary-treasurer, respectively, of the Wright County Medical Society at the annual meeting in Buffalo, recently.——Dr. John C. Staley,

who has been superintendent of the Ancker Hospital, St. Paul, since the death of Dr. Ancker the first part of the year, has resigned on account of poor health.

Society News.—At the annual meeting of the Minnesota Hospital Association in Milwaukee, Dr. Karl H. Van Norman, superintendent of the Miller Hospital, St. Paul, was elected president. William Mills, superintendent of the Swedish Hospital, Minneapolis, was elected secretary.——At the annual meeting of the Minnesota State Sanitary Conference in St. Paul, recently, Dr. Ludwig L. Sogge, Windom, was elected president; Dr. George G. Balcom, Lake Wilson, vice president, and Dr. Albert J. Chesley, Minneapolis, secretary-treasurer.

MISSOURI

"Prepare for Inspection."—Dr. Cortez F. Enloe, state health commissioner, announced, November 13, that every physician and surgeon, osteopath, chiropractor, or any one practicing any form of healing in Missouri, will be listed by the state board of health and their credentials and records thoroughly investigated.

NEBRASKA

Personal.—Dr. Stanley C. Clements has succeeded Dr. Roland Breuer as examining physician at the state tuberculosis association's clinic at Lincoln.——Dr. Harrison I. Shull, Auburn, pioneer physician, has retired from practice at the age of 83.

NEW JERSEY

New Hospital Superintendents.—Dr. Alfred A. Mutter, Kearney, has been appointed resident medical director of the New Jersey Home for Disabled Soldiers, Kearney, to succeed Dr. Burtis E. Goldberg, Arlington, who resigned recently. ——Dr. Howard R. Dukes, Kearney, has been appointed medical director of the West Hudson Hospital, Arlington, to succeed Dr. Widmer E. Doremus, who resigned. Dr. Burtis E. Goldberg has been appointed first assistant to Dr. Chester R. Brown on the medical service.

NEW YORK

New Medical Society.—The Riverside Medical Society has been organized in New York by physicians of the west end section of the city. Dr. Isador W. Kahn is president; Dr. Martin Cohen, vice president; Dr. Samuel Morse, secretary, and Dr. Morris Murray Peshkin, treasurer. The first meeting was held at the Hotel Majestic, November 20. Dr. Smith Ely Jelliffe was the principal speaker.

Tuberculosis Campaign.—A series of lectures and clinics are now being given to physicians at Syracuse with the cooperation of the Medical College of Syracuse University, the city health department and the Syracuse Health and Tuberculosis Demonstration, which is financed largely by the Milbank Foundation (The Journal, November 17, p. 1700). All phases of the tuberculosis problem are being presented with special attention to early diagnosis. Among those giving lectures and clinics are: Drs. Edward R. Baldwin, Trudeau Sanatorium, Saranac Lake; Oliver W. H. Mitchell, professor of bacteriology, Syracuse University; Charles Hendee Smith, professor of clinical diseases of children, Columbia University, New York City; Henry G. Bugbee, St. Luke's Hospital, New York City, and Livingston Farrand, president of Cornell University, New York City.

United Hospital Fund.—The forty-fourth annual report of the United Hospital Fund, published November 14, covers the work of fifty-six hospitals. During the year (ending June 30, 1923) 201,271 patients were treated, of whom 41,310 were treated without charge. Forty-five of the hospitals are in New York City, eleven in Brooklyn. Of the patients who paid something for their care 20,248 were public charges for whom the city paid in part and 88,596 were ward patients, part of whose expenses were paid by themselves or relatives. The total expense of operating all the hospitals in the fund was $15,641,369. Receipts of the fund were $643,626, an increase of $58,069 over last year. Legacies were as follows: Charlotte Williams, $187; Eleanor Fisher Clarke, $4,916; Philip Findler, $3,248, and Julius Loewenthal, $500. The report refers to adequate ambulance provision as one of the most vital necessities in the city and urges that the service be taken over by the city and managed like the police and fire departments.

New York City

Hospitals to Consolidate.—Following a survey of the hospital situation in the downtown district, the boards of directors of the Beekman Street and Broad Street hospitals have decided to consolidate the two institutions.

Tuberculosis Campaign in Bowling Green District.—Emphasis has recently been laid on the fact that the Bowling Green district of Manhattan is twenty-five years behind certain other sections of the city in fighting tuberculosis. The death rate in this section of the city is that of twenty-five years ago, and for every tuberculosis death it is estimated that there are six living persons who have the disease. The Bowling Green Neighborhood Association is starting a campaign to combat the disease in that part of the city.

Associated Out-Patient Clinics of the City of New York.—At a meeting of the section of medicine of the Associated Out-Patient Clinics held, November 21, the standards for medical clinics drafted by the executive committee of the section were discussed. The program included these topics: "Should the number of patients admitted be limited in relation to the number of physicians?" "Should patients be diagnosed in the general medical clinic before assignment to special classes?" "Is thoroughness of records essential to efficient work in medicine?" "Should records be filed centrally?" "What should be the relation of the out-patient staff to the medical staff of the hospital?" "Value and use of standards." "Suggestions for further activities of the section." The proposed standards were adopted and will be published at a later date.

Quacks in New York.—Recent exposures in Connecticut of men who are practicing medicine under the protection of bogus medical diplomas has led to a survey of the situation in New York. During the course of exposures in Connecticut charges were made that there were among the interns of the Lying-In Hospital several who held diplomas from alleged Missouri diploma mills. The records of the hospital show that among all the interns employed in the hospital during the last few years only three presented credentials from the St. Louis College of Physicians and Surgeons and each of these had had actual medical instruction in other institutions. Dr. S. Dana Hubbard, director of public health education of the department of health, makes the statement that there are from 1,200 to 1,500 persons practicing medicine illegally in Greater New York, most of whom are chiropractors.

OHIO

Quarantine for Diphtheria.—An outbreak of diphtheria at Burbank has caused Wayne County health officials to quarantine the entire village.

Hanna Lecture.—Prof. A. Biedl, Prague, Czechoslovakia, delivered the eleventh Hanna lecture at the medical library of Western Reserve University School of Medicine, Cleveland, November 19. His subject was "The Nervous and Endocrine Control of the Functions of the Alimentary Tract."

OREGON

Dr. Josephi Honored.—The degree of LL.D. is to be conferred on Dr. Simeon E. Josephi, Portland, by the University of Oregon at the commencement exercises at Eugene, in June, 1924, in recognition of his long services and to commemorate the twenty-five years he spent as dean of the medical school of that university. Dr. Josephi was first dean of the Medical School of the University of Oregon.

PENNSYLVANIA

Medical Library Bequeathed to Hospital.—The medical library of the late Dr. Jacob Rosenbloom, Pittsburgh, has been bequeathed to Beth Israel Hospital, New York City, it was announced, November 18. The collection is valued at $50,000.

Philadelphia

Welfare Campaign Closes.—The year's campaign of the welfare federation to raise $3,000,000 with which to support the 130 member agencies was closed, November 15. A total of $2,883,978 was raised. The trustees of the federation will undertake to raise the additional sum.

RHODE ISLAND

New Medical Practice Act.—The Rhode Island Board of Health has directed the secretary, Dr. Byron U. Richards, to make a survey of the laws of several states with a view to amendments of the present medical practice act of Rhode Island, which will be sought at the next session of the state legislature. One of the chief aims of the proposed amendments will be to provide a heavier penalty for violations

of the medical practice act. The maximum fine under the present law for a serious violation of the statute is $50. Another change sought is to require better preparation of persons seeking to practice medicine in Rhode Island.

TENNESSEE

County Physicians Organize.—The Tri-State County Medical Society was organized, November 8, at McKenzie, by physicians of Henry, Carroll and Weakley counties. Dr. Augustus A. Oliver, Paris, was elected president; Dr. Harris T. Collier, McKenzie, vice president, and Dr. R. M. Little, Martin, secretary. Meetings will be held the first Tuesday in each month.

TEXAS

Dr. Cary Honored.—The board of trustees of Baylor University College of Medicine, Dallas, recently officially named the medical science building in honor of Dr. Edward H. Cary, Dallas.

Missouri "Diplomas" in Texas.—Dr. Thomas J. Crowe, Dallas, chairman of the state board of medical examiners, is gathering evidence against a group of ten so-called physicians practicing medicine in one county alone who are holders of "diplomas" issued by one or the other of the Missouri schools now under investigation following the issue of fake diplomas. Many other such diploma holders are practicing in the state, it was announced at a meeting of the board of councillors of the state medical association held at Fort Worth, recently.

VIRGINIA

Personal.—Dr. Richard H. Meade, Jr., Richmond, has been appointed a medical missionary to St. James Hospital, Nanking, China. Dr. Henry R. Taylor, Norfolk, is in charge of the institution.

Medical Association of the Valley of Virginia.—At the annual meeting of the association in Staunton, recently, Dr. John M. Emmett, Clifton Forge, was elected president; Drs. David M. Kipps, Front Royal, Achilles L. Tynes, Staunton, and Benjamin B. Dutton, Winchester, vice presidents, and Dr. Alex F. Robertson, Jr., Staunton, secretary.

WISCONSIN

Appointment by State Board of Control.—The State Board of Control has announced the appointment of Dr. C. C. Atherton, Kankakee, Ill., as superintendent of the Southern Wisconsin Colony and Training School for the Feeble-Minded. Dr. Atherton suceeds Dr. H. M. Werner, resigned.

Ninth Councilor District Meeting.—Fifty physicians from central Wisconsin attended the quarterly meeting of the Ninth Councilor District Medical Society, at Marshfield, November 22. Those who spoke before the society were: Drs. S. R. Slaymaker, Chicago; Edward L. Miloslavich, Milwaukee; K. W. Doege, Marshfield, and Mr. J. G. Crownhart, secretary of the state society.

Personal.—Paul F. Clark, Ph.D., professor of medical bacteriology at the University of Wisconsin, has returned from a semester's leave of absence. Dr. Clark served as delegate at the Pasteur centenary in Paris.——Three additions to the faculty of Marquette University School of Medicine, Milwaukee, have been announced by Dean Jermain. The new members are: Dr. Frederick Eigenberger, Sheboygan, pathologist; Dr. Joseph P. Hettwer, London, England, and Dr. Harry H. Beckman, New York.——Drs. Ralph Kaysen, Morrelle M. Bunch, Arthur H. Cohn and Urban A. Schlueter have been appointed police surgeons for Milwaukee.——Dr. Henry C. Werner has resigned as superintendent of the Southern Wisconsin Home for the Feebleminded and Epileptic, Union Grove, effective December 1.——Dr. Guerney Taylor, Milwaukee, has been elected secretary of the Wisconsin Anti-Tuberculosis Association.

CANAL ZONE

Society News.—The Medical Association of the Isthmian Canal Zone held its one hundred and ninety-eighth meeting at the Ancon Hospital recently. Dr. Jesse L. Byrd, health officer of Cristobal-Colon, presented "A Résumé of the Antimalarial Campaign at Cristobal-Colon, 1917-1922," and Dr. Dalferes P. Curry gave a lantern slide demonstration of the field work of the division of sanitation. Dr. Byrd pointed out that Cristobal-Colon, once most unhealthy, has been made thoroughly sanitary, yellow fever being practically eradicated, and malaria controlled.

CANADA

Special Training in Tuberculosis.—Special training in tuberculosis will be given in the various medical colleges of Canada. The arrangements at Queen's University Faculty of Medicine, Kingston, Ont., provide for one afternoon weekly at Mowat Sanatorium for the fifth year with particular attention to pulmonary tuberculosis; other clinics are devoted entirely to chronic nonpulmonary conditions. The University of Toronto Faculty of Medicine, Toronto, teaches tuberculosis by bedside clinics in the three clinical years. In the final year a systematic course is given, including lectures and bedside clinics. In the outpatient department of the Hospital for Sick Children, Toronto, a special clinic is held twice a week. A similar outpatient clinic is held at the General Hospital, Toronto. In the Western University Medical School, London, Ont., the clinic work is done in general wards and the outpatient clinics of the Victoria Hospital, London.

Society News.—At the third annual meeting of the Canadian Neuro-Psychiatric Association in Kingston, October 17, the following officers were elected for the ensuing year: president, Dr. Nelson H. Beemer, Mimico; vice president, Dr. James M. Forster, Whitby, and secretary, Dr. F. S. Vrooman, Toronto. Hon. Forbes E. Godfrey, minister of health, delivered an address.——At the annual meeting of the Canadian Tuberculosis Association in Edmonton, Dr. Charles D. Parfitt, Gravenhurst, was elected president. The next meeting will be held in Ottawa. A resolution in favor of establishing laboratories for research was adopted. It is hoped that $5,000 a year will be available for this purpose.——At the first meeting of the Saskatoon Medical Society at Saskatoon, Sask., October 7, the reorganization of the local society was completed and a public health day planned. Meetings will be held every second month. Officers of the society are: president, Dr. George R. Morse, Saskatoon; vice presidents, Drs. James J. Finn, Dundurn, and Alexander K. Cameron, Delisle, and secretary-treasurer, Dr. Ernest R. Myers, Saskatoon.

Personal.—Dr. Michael Steele, managing director of the Ancrum Brae Sanatorium, Stratford, Ont., and former member of parliament for South Perth, 1911-1921, has been appointed judge of the juvenile court of the county of Perth. ——Dr. John R. Currie has been appointed university medical officer, and Earl White, Ph.D., lecturer in chemistry, at Queens University Faculty of Medicine, Kingston, Ont.——Dr. William R. Reeds, who is working as a medical missionary in Honan Providence, China, has returned to that country after spending his furlough at his home in Toronto.——Drs. Frederick A. Aylesworth, Clarence E. Hill, Samuel M. Lyon and Walter W. Wright have been appointed senior demonstrators in ophthalmology at the University of Toronto Faculty of Medicine.——Dr. Andrew S. Moorhead, Toronto, has been appointed chief medical adviser of the Central Appeal Board, dealing with soldiers' pensions, with headquarters in Toronto. Dr. Frank C. McTavish has been appointed medical adviser for the western district with headquarters at Vancouver, B. C.——Dr. Anna St. Clair Creighton, Halifax, N. S., has been appointed to the roentgen-ray department of the Finley Hospital, Dubuque, Iowa.

GENERAL

Hospital Expenditures.—At the annual meeting of the American Hospital Association in Milwaukee, recently, it was stated that the total value of hospital buildings and grounds in the United States is nearly $2,000,000,000, and the total expenditure annually for maintenance of the 6,000 hospitals is approximately $525,000,000. A sum of $350,000,000 will be spent during the next year for new buildings and equipment, it was also stated.

New Child Health Film.—The U. S. Children's Bureau, Department of Labor, Washington, D. C., announces the production of a new motion picture on prenatal care, entitled "Well Born." This will be loaned to responsible persons and agencies with the understanding that the borrower defrays express charges back and forth, employs a competent motion picture operator, and guarantees safe keeping. Those who desire to purchase the film may apply to the bureau for information and prices.

Goiter Association to Hold Meeting.—The American Society for the Study of Goiter will hold a session in Bloomington, Ill., Jan. 24-26, 1924, under the presidency of Dr. E. P. Sloan, Bloomington. The first day of the session will be devoted to operative clinics, and the remaining two days to scientific sessions. The program includes discussions by Drs. F. H. Lahey, Boston; W. Babcock, Philadelphia; W. S. Bainbridge.

New York City, and W. Engelbach, St. Louis. Information concerning the session may be had from the secretary, Dr. J. D. Moschelle, Indianapolis.

Nobel Prize Again Divided.—Drs. J. J. R. McLeod, Toronto, Canada, and Frederick G. Banting, Toronto, between whom the Nobel prize for medicine of $40,000 for 1923 was divided, have each again divided the prize, so that James B. Collip, Ph.D., professor of biochemistry in the University of Alberta Faculty of Medicine, Edmonton, and Dr. C. H. Best, Toronto, collaborators in the work on insulin, will each receive $10,000, according to *Science*. Dr. Banting had already donated $10,000 of his share of the prize to the Banting Research Fund (THE JOURNAL, November 24, p. 1797).

Tri-State Changes Name.—The Tri-State District Medical Society (Iowa, Illinois, Wisconsin) added Minnesota, Indiana and Missouri to its territory and changed its name to the Interstate Assembly of Physicians and Surgeons at the annual meeting in Des Moines, Iowa, October 29-November 1 (THE JOURNAL, October 20, p. 1371, and November 17, p. 1702). The next annual meeting will be held at Rochester, Minn., under the presidency of Dr. Clifford U. Collins, Peoria, Ill. About thirty clinics were given during the four day session. A clinic journey to Canada and the British Isles in the near future was proposed.

The National Board Bulletin.—THE JOURNAL has received a copy of No. 1, Vol. 1, of the *National Board Bulletin* to be published bimonthly by the National Board of Medical Examiners. It is to be a medium through which candidates for the examination, those who have secured the board's certificate, medical teachers or others who act as subsidiary examiners, and others interested, may be kept informed in regard to the work and progress of the board. It will contain information in regard to forthcoming examinations and reports of passed examinations. This bulletin has a justifiable reason for its existence and contains interesting information in regard to the National Board of Medical Examiners.

Scientific Society Organized.—The Northwest Scientific Association was organized at a meeting in Spokane, recently, with 134 charter members. This association opens its doors to any one interested in the various lines of scientific endeavor in medicine, bacteriology, zoology, physics, chemistry, psychology, education and history. Members will be drawn largely from the states of Oregon, Idaho, Montana and Washington and the Canadian provinces of British Columbia, Alberta and Saskatchewan. One or more regular meetings will be held each year for the presentation and discussion of papers. Martin F. Angell, Ph.D., dean of the University of Idaho, Moscow, was elected president, and Frederick D. Heald, Ph.D., State College of Washington, Pullman, secretary.

Society News.—The State and Provincial Health Officers of North America announced recently that the next meeting will be in Lansing, Mich., in May, 1924. Dr. Clyde C. Slemons, health officer of Grand Rapids, Mich., has been elected head of the health administration section of the organization.—The annual meeting of the Association for Research in Nervous and Mental Diseases will be held at the Hotel Commodore, New York City, December 27-28, under the presidency of Dr. Walter Timme, New York City. The subject for discussion will be: "Hereditary Nervous and Mental Diseases."——The next annual meeting of the American Student Health Association will be held in Cincinnati, Jan. 1-2, 1924, under the presidency of Dr. Joseph E. Raycroft, Princeton, N. J. The program will be devoted to an informal consideration of clinical questions.——The annual mid-winter meeting of the Sioux Valley Medical Association will be held in Sioux City, Iowa, Jan. 22-24, 1924.

American Association for the Advancement of Science.—At a meeting of the executive committee of the association in Washington, D. C., October 14, the appointment of Charles A. Shull, Ph.D., of the University of Chicago, to be assistant secretary of the association in the place of Samuel F. Trelease, Ph.D., resigned, was approved. One hundred and twenty-six fellows were elected. On Sept. 30, 1923, the total enrolment was 11,704. It was voted that the association shall hold a summer meeting at Buffalo, preceding the Toronto, Canada, meeting of the British Association for the Advancement of Science, September, 1924. It was also voted that the annual meeting for 1927 shall be held in Philadelphia. Future annual meetings have been arranged as follows:

1924, Cincinnati, Dec. 27, 1923-Jan. 2, 1924.
1925, Washington, D. C., Dec. 29, 1924-Jan. 3, 1925.
1926, Kansas City, Mo., Dec. 28, 1925-Jan. 1, 1926.
1927, Philadelphia, Dec. 27, 1926-Jan. 1, 1927.
1928, ————————, Dec. 26-31, 1927.
1929, New York, Dec. 27, 1928-Jan. 3, 1929.

American Child Health Association Scholarships.—Resident and travel scholarships by the American Child Health Association have been awarded to fifteen American physicians, it was announced November 20. They are: Drs. Charles W. Armstrong, Salisbury, N. C.; William W. Bauer, Milwaukee; Romulus L. Carlton, Winston-Salem, N. C.; Eugene O. Chimene, Minneapolis, Kan.; William De Kleine, Saginaw, Mich.; Seymour Fiske, New York; Arthur M. Kimberly, Bristol, Conn.; George A. Lamont, Vancouver, B. C., Canada; George N. Leonard, Albany, N. Y.; Marie M. P. Long, Memphis, Tenn.; George C. Marlette, Bay Minette, Ala.; Walter R. Moore, St. Joseph, Mo.; Russell B. Sprague, Yarmouthport, Mass.; Thomas D. Walker, Macon, Ga., and Ruth Weissman, Dorchester, Mass. These scholarships were awarded on the basis of graduation from an accredited medical school, and on evidence of the candidate's interest in child health work. Dr. Richard Bolt, director of medical service of the association, is authorized by the committee on awards to act in an advisory capacity, to assist candidates in the selection of courses.

Abridged Life Tables.—The Bureau of the Census has just issued "United States Abridged Life Tables, 1919-1920." This is the third official publication of life tables by the bureau, and is intended as a supplement to the much larger volume of life tables published in 1921. These have been called "abridged" because of the process of construction and because life table values are given at every fifth year of age instead of at each year of age. They give four life table functions: rate of mortality per thousand, number of survivors to each age out of 100,000 born alive, number of deaths in each age interval out of 100,000 born alive, and the complete expectation of life in years. The abridged tables relate to 74 per cent. of the population of the United States, whereas the 1910 tables relate to about 28 per cent., of which not more than 2 per cent. are negroes. Under these circumstances life tables for total populations and for white populations do not differ much, but, in the groups of population for which the abridged tables were constructed, the percentage of colored people varies from 0.6 to as much as 51.4 per cent. of the group. These tables, except for Hawaii, are for white or negro populations, not for the aggregate population. To render comparison easy, the values of each life table function are grouped in tables by sex. By various means facts are indicated briefly, for example, bold-faced figures in any age group indicate that the rate of mortality among females is greater than among males, and figures in italics indicate values taken from the 1909-1911 life tables for whites and negroes in the original registration states. The second part of this work is a description of the process of computing the abridged tables, the third the original statistics on which they are based. There are in all ninety-two tables by sex; eighty are based on statistics of the white population, eight on those of the negro population, and four on the population of Hawaii.

Fraud Order Against Oriental University.—The Department of the Interior, according to a memorandum issued by the U. S. Bureau of Education, has been advised that a fraud order against Oriental University, a correspondence school located in Washington, D. C., preventing its future use of the mails, was issued by the Post Office Department on November 5. An investigation of the institution made by that department showed that it was engaged in conducting a scheme for obtaining money through the mails by false pretenses.

The Oriental University was incorporated under the laws of the State of Virginia on March 11, 1904, to conduct "a nonsectarian, coeducational, and orientalistic education by residence and correspondence instruction, to undergraduate and graduate students; to carry on instruction and institute courses to lead to any of the bachelor, master, or doctor degrees in theology, philosophy, arts, sciences, pedagogy, literature, music, law, medicine, and orientalistics."

The "principal" offices of the Oriental University were first located in Alexandria, Va., but in 1912 were removed to Dominion Heights, Cherrydale, Va.

On Jan. 5, 1915, a paper was filed with the recorder of deeds of the District of Columbia, certifying that the board of trustees of the Eastern University (located in Washington, D. C., and incorporated under the District laws, Nov. 11, 1904), had voted to change the name of the institution to the "Oriental University." The filing of this paper constituted the institution's claim in incorporation under the laws of the District of Columbia.

The object of the incorporation of Eastern University, whose charter was thus taken over by Oriental University, was stated to be "for the purpose of providing instruction in the various departments of the university, either by correspondence or personal attendance," including, in addition to

the usual departments of arts and sciences, graduate school, engineering department, medical department, law, pharmacy, dentistry, and theology, "a school of osteopathy and osteotherapy, school of scientific medical massage, school of chiropractic, school of electro-therapeutics, school of chiropody, school of psychology." On the completion of the course in one of these departments or schools an appropriate degree was provided, listed in the articles of incorporation as follows: B.A., M.A., Ph.D., B.S., M.D., LL.B., LL.D., Ph G., LL.M., D.D.S., D.D., D.O., D.M., D.C., D.P., and D. Psychol.

Upon acquiring the charter of Eastern University the Oriental University moved its "principal" office to Washington, D. C., where it has been located in the home of its president and founder, H. P. Holler, at 1702 Oregon Avenue N.W., where most of its business is conducted.

The evidence on which the recommendation for the issuance of a fraud order was based showed that while Oriental University through its literature advertised resident courses, the institution operated exclusively through the mails; the numerous "resident" and "nonresident" professors listed in its catalogue performed no actual duties, except in a few instances to sign diplomas; that the faculty lists contained names of persons without their consent or knowledge; that the biennial registers of the institution have contained long lists of students "ex-matriculated" who were never in fact students of the university; that the Oriental University had no facilities for personally instructing resident students, and no facilities for instructing students in special lines such as medicine and engineering by correspondence, except that it had contracts with certain alleged "professors" who may or may not have had the qualifications to teach those subjects.

FOREIGN

Hospital News.—A wealthy Persian merchant, Haji Mohamed Hussan Namazi, has presented a maternity hospital to Shiraz, which will be operated by the Church Missionary Society. Dr. Emmerline Stuart of Dublin, Ireland, will direct the activities of the institution.

Personal.—Dr. W. Miguet, representative of the Belgium Child Health Association, at the American Child Health Association sessions, recently visited Fargo, N. D., to observe the work being done in the Fargo Child Health Demonstration under the auspices of the U. S. Public Health Service. ——The Naples Accademia Leonardo da Vinci has elected Dr. Sauerbruch of Munich an honorary member, in token of appreciation of his work in surgery of the thorax.

The Netherlands Council on Pharmacy and Chemistry.—The fifth publication issued by the Netherlands Council has been received. It contains the annual report for 1922, special articles on "Mistletoe in Treatment of High Blood Pressure"; "Comparison of Pituitary Preparations"; "Preferable Formula for Procain Solutions," and "Pregl's Iodin Solution," and thirty pages are devoted to analysis and comment on twenty-seven different proprietary preparations. The varying behavior of solutions of procain is ascribed to the reaction. In a slightly acid solution, it can be sterilized at 100 C. But when the reaction veers to alkaline, it cannot stand a temperature of 100.

A Plea for the Retention of the Famous Lister Ward in Glasgow.—James A. Morris, associate of the Royal Scottish Academy, fellow of the Royal Institute of British Architects, and a member of the Art Workers Guild, has issued a dignified and temperate protest against razing "the famous Lister Ward" by the managers of the Royal Infirmary in Glasgow. He suggests, instead, a plan for saving the Lister Ward through making it a museum, as was suggested originally by Lucas-Championnière, thus establishing it as a world shrine in memory of the greatest public benefactor the city of Glasgow has ever had. Even to contemplate the destruction of the Lister Ward at this time, when the centennial birthday of Lister is to be celebrated throughout the world so soon (April 5, 1927), he says, is evidence of vast ignorance of the attitude of the medical profession and their reverence for Lister, or of gross indifference to the sentiments and real feeling of mankind for this benevolent and kindly father of modern scientific surgery.

Medical News from Japan.—The *Japan Medical World* states that during the earthquake and fire, September 1, its publishing, editorial offices and library were completely destroyed by fire. Numbers 9 and 10, Vol. 3, are published as one issue under date of October 15 owing to these conditions. Temporary offices have been established at 531 Sendagayo, Tokyo, and regular publication will be resumed with the November number.——It has been ascertained that the fire, which destroyed the Tokyo Imperial University and the Japan College of Dentistry during the earthquake, September 1, originated in each case from the explosion of chemicals in their laboratories.——Professors on being retired because of the age limit will receive retirement allowances at the time of dismissal in addition to their pensions, it is announced by the officials of the Tokyo Imperial University.——To commemorate the Imperial wedding next spring the Tokyo Chamber of Commerce will establish a new hospital which will give medical aid to the populace at cost price.——Among recent welfare projects approved by the home office is the establishment of an orphanage for children at a cost of 950,000 yen ($475,000) and additions to the tuberculosis sanatorium at a cost of 200,000 yen ($100,000). The establishment of a national leprosarium and a national hospital for the insane was disapproved.

The Eugenics Conference in Sweden.—The Mendel Society of the University of Lund invited the International Eugenics Commission to a conference, and Herwerden gives an account of the successful meeting in the *Nederlandsch Tijdschrift*. The president of the Eugenic Education Society, Major Leonard Darwin, the second son of Charles Darwin, presided. He also presided at the first eugenics congress at London in 1911. The second congress was held in New York in 1921. America was represented at the conference in August by Dr. Allan J. McLaughlin, director of the Eugenics Record Office at Coldsprings Harbor, N. Y. He has been consulting with various governments in Europe in regard to selecting immigrants before they sail, instead of waiting until they arrive in America. The Mendel Society at Lund publishes the journal *Hereditas*. The president of the society is Nilsson Ehle, whose research on the crossing of grains has materially increased Sweden's harvests. The commission visited Upsala, where Lundborg presides over the State Institute for Research on Heredity, the only one of the kind in Europe. The anthropologic research of his field workers has already resulted in a card catalogue of all Swedish subjects. The genealogical trees of the Laplanders show that notwithstanding their nomadic life, their church records have been kept without a break for centuries. The Swedish legislature has been considering a bill for the sterilization of the unfit, but Lundborg advised against its adoption.

Government Services

Captain Gwynne Acquitted

Capt. Samuel C. Gwynne, M. C., U. S. Army, retired, was acquitted by a court martial at Washington, D. C., November 7, of charges growing out of the case of Pvt. Guy Pendleton (THE JOURNAL, August 25, p. 671). Captain Gwynne was the ward surgeon at Camp Eustis, Va., where Private Pendleton was first under treatment.

Hospitals Authorized

Pursuant to instructions of the Secretary of War the organization of General Hospital No. 121 (St. Francis Hospital Unit, Wichita, Kansas), organized reserves; General Hospital No. 42 (University of Maryland School of Medicine Unit, Baltimore), organized reserves; Evacuation Hospital No. 5 (Massachusetts Homeopathic Hospital Unit, Boston), and Evacuation Hospital No. 55 (St. Mary's Hospital Unit, Oshkosh, Wis.) have been authorized.

U. S. Public Health Service Personals

Asst. Surg.-Gen. Rupert Blue has been relieved from duty in charge of service operations in Europe, and directed to proceed to the United States. Dr. Blue, who has been abroad for the last three years, attended the recent opium conference of the League of Nations at Geneva, Switzerland, as a special delegate from the United States. He was recently made a Chevalier of the Legion of Honor by the French government. Surg. Walter W. King of the American consulate in London has been directed to proceed to Paris, France, to assume charge of the U. S. Public Health Service activities in Europe, succeeding Dr. Blue.——P. A. Surg. Richard B. Norment, Jr., head of the child hygiene department, Hagerstown, Md., has resigned from the service, effective on the expiration of four months' accrued leave of absence, Feb. 22, 1924.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 12, 1923.

The Panel Struggle

The amended offer by the minister of health is regarded by the panel physicians as a great victory, and by the representatives of the friendly societies as a surrender. Dr. Brackenbury, chairman of the Insurance Acts Committee of the British Medical Association, says: "We have won on all points on which we placed most importance, and gained an advance on the rest. On the whole, I think we have done very well. The main point, first, is that we have secured that the position of our remuneration and of medical benefit shall be in the form in which we wanted it. In the second place, we have secured that the remuneration of the physicians shall be determined on its merits, between the government and the profession and nobody else. The third point is in reference to the character of the inquiry by the royal commission into the panel system. This is to be a full inquiry, not merely into the medical side and the financial side, but also into the working of the approved (friendly) societies, and the commissioners will be an independent body of persons without vested interests." On the other hand, Sir Thomas Neill, chairman of the Consultative Committee of the Approved Societies, said: "The government, not wishing to take any more money from the taxpayers, and having raised the physicians' fee without considering the societies, is now going to rob the henroost of the insured members to satisfy the physicians. The only bulwark the insured persons have against the proposals of the government to rob their funds is now the House of Commons. We welcome the suggestion of a full inquiry. Many things can be raised there which have not been said." It has also been decided, in view of the general election now so near, to circularize the 15 million insured persons denouncing this as the first occasion in which any government has sought to appropriate their funds for other purposes than those for which they were contributed.

Child Assault and Venereal Disease

At a meeting of the National Council for Combating Venereal Diseases, a resolution was passed that the council views with concern the extent of the crime of child assault. Many of these assaults lead to the communication of venereal disease to young girls. Public opinion should be aroused to the evil, and the existing laws should be stringently administered. The council is of the opinion that financial penalties do not act as a sufficient deterrent, and that severe penalties should be imposed. At a joint meeting of the National Council and the Society for the Prevention of Venereal Diseases (whose differences have frequently been described in previous letters), it was resolved that the ultimate fusion of the two societies is desirable. It was also resolved that the law should be so altered as to permit qualified pharmacists to sell *ad hoc* disinfectants for the prevention of venereal disease in those who expose themselves to infection, provided such disinfectants are sold in a form approved and with instructions for use by some competent authority.

The Health of School Children

The report of Sir George Newman, chief medical officer of the board of education on "The Health of the School Child in 1922," has just been issued. He laments the need for financial restrictions, which have arrested almost at their birth many of the developments proposed in recent legislation. The "most serious and wasteful defect in our national health service" is, he considers, the lack of adequate supervision of the infant during preschool life. The most urgent questions awaiting solution in many educational areas are: (1) the further coordination of the school medical work with the public health service; (2) the physical condition of children under 5 years of age; (3) the effective education of the dull or backward child; (4) the importance of a comprehensive scheme for the treatment of dental defects, and (5) the systematic organization of the teaching of hygiene and physical training. During 1922, 1,751,122 children were subjected to routine medical inspection, and to this number must be added 635,628 children who were examined as "special" cases. Thus, of the 5,180,589 children in average attendance at the elementary school during 1922, no less than 2,386,750, or 46 per cent., were medically inspected. The cooperation of parents is being cultivated in every possible way; very few now object to school medical inspection, and in the great majority of cases it is welcomed. The school medical officers report increased attendance of parents with their children at the school clinics. On the need for supervision of the child before it reaches the school age, Sir George Newman is emphatic. From 80 to 90 per cent. of children are born healthy and with potentiality of leading healthy and normal lives. The work on behalf of the new-born child increases from year to year, yet, comprehensive as it has become, the close supervision of the infant extends but little beyond the first year. After the first year of life the young child has to bear a heavy burden of environmental neglect, associated with bad housing, poverty, and absence of hygienic supervision. As a result, the school medical service is faced with the fact that, out of an infant population born healthy, from 35 to 40 per cent. admitted to school at 5 years of age bear physical defects which might have been either prevented or cured. This is the most serious and wasteful defect in our national health service.

As regards sanitation, the report says, it travels from the school to the home, and the child of today is the householder of tomorrow. The effective teaching of hygiene in each school and to each class is of the first importance. If for eight or nine years the child is taught of what personal and public health really consist, immense good will result. The child and the young adolescent must be trained in the way of health and physical efficiency. In order to secure this, it is necessary that the teacher be properly equipped. A great responsibility rests on the training colleges to provide this preparation for the teacher. The health instruction in the school must be adequate. It should be not only information, but also a direction; it should be not only intermittent and theoretical, but also continuous and practical. Every week, some definite guidance should be given and repeated until habits are formed. Until hygiene is a habit and a way of life, it is of little avail.

DEFECTS AND DISEASES

Routine medical inspection shows that about 40 per cent. of the children have a greater or less degree of physical defect. Definite malnutrition, heart disease, anemia and deformities are each present in about 2 per cent.—broadly, 100,000 children suffering from each of the four conditions. A large burden of disease, 20 per cent., consists of defective vision; ear, nose and throat disease, 14 per cent.; and a severe degree of dental disease, 34 per cent. As to vision, 10 per cent. of the children suffer from serious defect. These are maladies found at the school; there are, in addition, the infectious diseases, which unfortunately often leave behind a good deal of disablement and the seeds of further disease. In nineteen of the largest representative areas in England and Wales there was a routine medical inspection of 707,346 children. Of this total, 241,052 suffered from dental disease, 145,521 from defective vision, and 90,832 from nose and throat disease. Enlarged tonsils and adenoids are "a serious mass of debilitating disease."

VIENNA

(From Our Regular Correspondent)

Oct. 31, 1923.

Wilful Infection with Syphilis—A Criminal Offense

For the first time in this country, a county court has passed sentence on a man who knowingly transmitted syphilis to another person; this new departure may prove of the utmost importance in the promotion of public health. When the girl who was infected became aware of her misfortune, she sued for damages, and for the expenses incurred by her for medical treatment and loss of work. At the hearing, it was stated by witnesses that the man had acquired the disease one year before he became friendly with the woman. He had been under treatment, but had discontinued it before the physician had declared him cured. The judge laid special stress on this point, saying that every man knew that he must be "cured" —as that term is applied—before entering into sexual relations. By knowingly neglecting this fundamental precaution, the defendant had committed a serious offense; he was ordered to pay twenty million kronen ($300) damages and another $300 for the costs of medical treatment. An appeal against this judgment was dismissed by the higher court. Both medical and daily papers commented favorably on the incident; one pointed out that this judgment will materially help the police to secure statutes making the treatment of venereal disease compulsory. In the new parliament, elected a few days ago, there will be many in favor of this movement.

The Dangers of Domestic Electricity

The ministry for education has issued an order requiring teachers in public schools to give special instruction to their pupils on the dangers involved by the use of electricity in the household. A series of lectures on this subject was delivered to the teachers by Prof. L. Jellinek. He pointed out that it is a mistake to regard only high voltage currents as dangerous. In handling electric lamps or switches, people often receive a slight shock and pay no attention to it. But under specially unfavorable conditions, such a shock may even prove fatal. If the person happens to be standing on a good electric conductor (a wet concrete floor, an iron grating, damp earth) a current of only 200 volts may cause serious harm. Simultaneous contact with an electric cable or lamp and a water pipe or gas pipe is most dangerous. Children should be warned especially against using tools or instruments on electric fixtures, and against touching any electric appliance with wet hands (bathroom). Lantern slides were used to illustrate the lectures, and these slides will also be used in the schools.

Hospital Statistics

The official report of the board of health gives the number of medical homes and hospitals in this country, in 1921, as 284, of which only eighty-six were public institutions; the rest were private, but not necessarily operated for profit. The number of beds available was 38,996, of which only 12,062 were in the private homes. The medical staff in the eighty-four public hospitals consisted of 1,159 physicians, and in the private institutions only 492: an average of twenty-three beds to each physician in the public and twenty-seven in the private hospitals. The number of nurses employed was 6,555 (4,677 public, and 1,878 private) or one for each six beds in the public hospitals, as compared with one to seven in the private hospitals. The number of patients in that year was 309,612, of whom only 82,608 were treated in the private institutes. Among other interesting notes there are a few words about anthrax in Austria. In 1919, only one case was reported and treated in hospital. The year 1920 was entirely free from this disease. In 1921, eight cases were seen, with three deaths; in 1922, eight cases with one death, and in the first half of 1923, one case was reported and verified, and one suspicious case was still under observation. Nearly all these cases were observed in one district in upper Austria among butchers who acquired the disease by handling infected animals.

Graduations in Vienna in 1922-1923

A report from the Vienna University gives some interesting figures on the number of graduates in medicine. In the year 1922-1923 (October to July), out of 868 graduations, 485 students obtained the diploma of M.D., 254 in the winter, and 231 in the summer term. Of these, forty-eight were women. Two hundred and eleven had signed a written obligation not to practice in the Austrian Republic, under the rules of the university, which allow foreign students to graduate only on this condition. Of the remaining 274 medical graduates, only 58 per cent. were of Austrian birth, the remainder having obtained Austrian citizenship before entering the medical course. This means that of the total graduates of one year, only 33 per cent. are Austrian born, and 67 per cent. are citizens of the necessary states or foreign born. These figures indicate the importance of the Vienna University to the eastern and southern part of Europe.

Discussion on Insulin

The recent meeting of the Vienna Medical Society was devoted to the discussion of insulin. Acting on an invitation by the insulin committee of Toronto, Drs. Pollak and Falta have taken up the study of and the experiments with this substance in Vienna. The remedy is manufactured in the laboratory of the Vienna Pharmacologic Institute, and is standardized according to the Toronto unit, that amount which depresses the blood glycogen level of a rabbit of 2 kg. to 0.45 mg. per thousand cubic centimeters. The clinical unit used in several other places is about one third of this unit, but is not much in favor with research workers. Dr. Pollak stated that the indications for the use of insulin may be summarized under the following points: coma, and the precomatose conditions which are little influenced by sodium bicarbonate; surgical complications, and refractory cases. A relative indication is offered in cases in which a protein-poor diet has good effect; but this diet cannot be continued for long. The idea is to keep the patient sugar free for a week, at least, so as to give the insulin-producing mechanism a chance to recover its function. Exact control of blood and urine is paramount at first; later the urine may be examined daily, the blood not so often. This makes treatment at home more feasible. Dr. Pollak has had under control a series of twenty severe cases, and Dr. Falta another series. The latter also reported his observations, which coincide, as to favorable effects, with those of all other workers. He too recommended its use in grave cases with acidosis, and septic and gangrenous symptoms, while dietetic measures often suffice in slighter cases. The high price of the remedy is a serious drawback. Public contributions for a large fund have been urged, to enable the public hospitals to obtain a sufficient quantity of the substance for the treatment of numerous patients. In the discussion that followed the two reports, all were unanimous that the importance of the new remedy cannot be overestimated.

An Outbreak of Typhoid

In illustration of the rarity of typhoid in this city since the regulation of the water supply, it is worthy of note that the board of health has found it necessary to inform the public of a small outbreak in October, which since has been subdued. All cases (twenty-five altogether) were traced to a foreign source, and not a single patient was a Vienna inhabitant; all had acquired the infection outside the city. While in previous years the morbidity and mortality from this source was appalling, and even fifty years ago more than

1,000 persons were infected each year, since 1890 there have been only about ten or twelve cases each year; even in war time Vienna was comparatively free from typhoid, as a result of the supply of absolutely unimpeachable water in abundant quantity throughout the city.

PARIS

(From Our Regular Correspondent)

Nov. 9, 1923.

Vital Statistics

The accompanying table gives the vital statistics for France during the first six months of the current year, together with the statistics for the corresponding six months of 1922.

Vital Statistics for January-June, 1923

	1923	1922
Births	395,863	396,726
Deaths	352,239	387,681
Excess of births over deaths	43,624	9,045
Marriages	176,114	193,454
Divorces	11,965	14,305

The population of France increased, during the first six months of 1923, by 43,624, a low figure, but sensibly higher than that of the corresponding period of 1922, which was only 9,045. This improvement is due solely to the decrease in the number of deaths; the births have actually decreased. The number of marriages shows a sharp decline; there were 17,340 fewer marriages in 1923 than in 1922. The divorces, however, decreased by 2,340. The record for Paris, during the first six months of 1923, was: 30,154 births, 25,778 deaths, 18,320 marriages and 2,275 divorces.

Responsibility for Operation Performed Without Consent of the Patient

A recent decision of the Court of Paris clears up some points with regard to the responsibility of a surgeon in case of an operation performed without the consent of the patient but which appeared necessary during the course of another intervention to which the patient had given consent.

As a general principle, it is true that consent of the patient must be secured before every operation; but a person who, after allowing himself to be examined by a surgeon, permits the surgeon to give him an anesthetic and thus voluntarily submits to an operation which is supposedly necessary to free him of the pain of which he complains, has no cause for action against the surgeon who, on account of cysts discovered during the course of the primary operation, decides on a secondary operation, which, in his judgment, is indispensable.

The court therefore dismissed the complaint of a woman who alleged, but furnished no proof, that a practitioner, after assuring her that only a slight operation was necessary, had, in opposition to her wishes and without apprising either her or her husband, performed an operation that deprived her of the hope of having children. The court held that it is not the duty of the courts to pass on the indications for or the effectiveness of a given surgical operation, and that it is sufficient to establish that the surgeon (whose good faith is not questioned) has conformed to the doctrines professed by the leaders in his profession, and that the technic employed was free from negligence.

Malaria in Syria

M. Pierre Even, member of the chamber of deputies, has requested the minister of war to inform him whether it is true that in Syria the army medical service administers to the troops of occupation prophylactic doses of quinin to ward off malarial attacks, and has called his attention to the enormous expense it has entailed to supply with quinin first 75,000, then 45,000, and finally 30,000 men. M. Even inquired whether or not prescriptions requiring the appropriation of such immense sums are justified by the existence of a wide incidence of malaria that is scientifically proved. The minister of war replied that the wide extent of sickness due to malaria, among the troops of the Army of the Levant, had necessitated the organization of a systematic campaign against malaria, since it had been found that very few regions of Cilicia in Syria are free from endemic foci. Preventive cinchonization, therefore, has been and still is employed, in principle, from April 1 to December 1, simultaneously with other procedures usually instituted in any campaign against malaria.

Higher Instruction in Cookery

Under the patronage of the undersecretary of state for technical instruction, the Société scientifique d'hygiène alimentaire has organized a course of higher instruction in cookery. The instruction will be given by Dr. Hemmerdinger, agrégé professor of the University of Paris; Dr. Henri Labbé, agrégé professor of the medical faculty of the university; M. Martel, doctor of sciences and director of the veterinary services of the prefecture of police, and others. Alimentary hygiene, rational cookery, purchase of foodstuffs, and dietetics are among the subjects to be taken up.

The Radio in Sanatoriums

Dr. Mourier, general director of the Assistance publique, desirous of providing some form of entertainment for the patients, has had a radio outfit installed in the antituberculosis sanatorium of Augicourt, at San Salvador and at Berck.

A Monument to Professor Monprofit

In the gardens of the School of Medicine and Pharmacy of Angers, a monument has been erected to Dr. Monprofit, who for many years was the head of the surgical clinic in that school. He had also been mayor of Angers, deputy from the department of Maine-et-Loire, and corresponding member of the Academy of Medicine. Professor Hartmann of Paris presided at the ceremonies.

Bestowal of Medallion on Dr. C. Walther

The pupils and friends of Dr. C. Walther, meeting recently in the Hôpital de la Pitié, presented him with a medallion in memory of his long period of activity, which has recently ended with his retirement. In attendance at the ceremonies were not only colleagues from Paris, Professors Pierre Marie, Chauffard, and de Lapersonne, but also surgeons from the provinces and from foreign countries: Professor Forgue of Montpellier, Dr. Témoin of Bourges, the Belgian surgeon Wilhems, and others.

A French Dispensary for Earthquake Sufferers

The medical mission of the government of French Indo-China has established at Tokyo a dispensary for earthquake sufferers. In his address at the dedicatory ceremonies, the French ambassador, M. Paul Claudel, stated that the French government had founded this dispensary in recognition of the services rendered, during the war, by the Japanese medical mission.

Necrology

From Rouen the death of Dr. Charles Bataille, hospital surgeon and professor at the school of medicine of that city, is announced.

Dr. Emile Tillot, since 1886 a corresponding member of the Academy of Medicine, has died at the age of 95.

Personal

Two new professors for the Faculté de médecine of Paris have been elected: Dr. Georges Guillain in place of Pierre Marie, who has retired, and Dr. J. A. Sicard, in place of Rénon, deceased.

MEXICO CITY

(From Our Regular Correspondent)

Oct. 27, 1923.

New Neuropsychiatric Society

The physicians of the National Insane Asylum, at a recent meeting, organized the Mexican Society of Neuropathology and Psychiatry. Dr. Nicholás Martinez, director of the institution, was appointed president of the society and Dr. Norma, secretary.

New Hospital

Through the generosity of Lady Cowdry, who donated for this purpose £100,000 (approximately $450,000), there will soon be opened in one of the most select districts of Mexico City a new hospital for indigent patients. In this institution, furnished with the latest equipment, poor people will receive medical assistance free of charge. A moderate fee will be collected from those able to pay, whether British subjects or of other nationalities. The hospital was opened, November 11, the fifth anniversary of the armistice. The institution will be called "Lady Cowdry Sanatorium," after its benefactress, who is the wife of one of the pioneer oil men in Mexico, Sir Wetman D. Pierson.

Personal

Dr. Jose Terres, a prominent Mexican physician and a professor in the medical school, has been seriously ill for several months.——Dr. Alfredo Caturegli, former Mexican minister to Germany, has been appointed chief of the public assistance bureau.——After spending more than a year in the United States and several months in Europe, studying public health science, Dr. Salvador Bermudez has returned to this country. The International Health Board, of New York City, had granted him a fellowship at Johns Hopkins School of Hygiene and Public Health, at which institution he obtained a P.H.D.——As Dr. Jesus Arroyo declined the position of editor of the *Gaceta Médica de Mexico*, the organ of the Mexican Academy of Medicine, a new election was held, at which the former editor, Dr. A. Brioso Vasconcelos, was reelected for two years.

BERLIN

(From Our Regular Correspondent)

Nov. 3, 1923.

New Tariff Schedule for Berlin Physicians

The commission of the Berlin "Chamber of Physicians" (*Aerztekammer*) and the Physicians League of Greater Berlin (*Aerztebund*) has just published a new tariff schedule for the use of Berlin physicians, who, in the face of the rapid depreciation of the mark, are endeavoring to establish medical fees on a firm basis. As the new schedule applies also to foreigners, it would seem to be a matter of general interest:

1. Medical fees shall be based on the tariff schedule that was in force just before the outbreak of the war, as expressed in gold marks. For the conversion of gold marks into paper marks the current exchange rate shall be employed.
2. The prewar fees in vogue in Berlin shall be: for an ordinary consultation at regular office hours, from 2 to 5 marks; for an ordinary call, from 3 to 10 marks. The lower fees are charged persons in moderate circumstances.
3. The fees for other forms of medical service shall be on the same basis.
4. In the application of fees, due consideration should be given to the changed circumstances of various classes of the population.
5. Special consideration should be given to patients who are suffering from financial difficulties. Patients in especially good circumstances may be charged more than the usual fees.
6. As a rule, immediate payment should be demanded. In the case of house practice, weekly settlements may be made, if daily payment does not seem feasible. Accounts should be adjusted at least once a week, even though the treatment should continue longer. Physicians are urged not to accept checks in payment of accounts.
7. Foreigners should be charged the full prewar fees in gold marks.
8. Foreigners who have taken up their residence in Germany and whose income is in German money should be charged the same fees as Germans.

Award of the Nobel Prize in Medicine

Professor Meyerhof, who has been awarded half of the Nobel prize in medicine for 1923, is 35 years of age. For a number of years he has been a privatdozent in the University of Kiel and first assistant in the physiologic institute of which Professor Höber is the director. The prize was awarded for work on the physiology of muscles. His investigations, carried out with frogs, concerned the relation between the chemical and the mechanical processes in muscle activity, the "laws" that govern the chemical reactions, the performance of work and the heat production of the muscle. Meyerhof was able to prove that only one third of the lactic acid formed during the work performance of muscle cells is decomposed and converted into heat; the other two thirds is changed back into muscle glycogen.

Death of Karewski

Professor Karewski, director of the surgical department of the Jewish Hospital in Berlin, died, October 31. He had been for many years director of the surgical policlinic of this hospital, but did not become director of the clinical department until a few years ago, his predecessor, Professor Israel, having retained this post until considerably past his seventieth year. Karewski was 60 years of age when he finally reached the coveted goal, but he was not destined to live many years to enjoy his honors. He spent his whole life in the service of the Jewish Hospital, having started work in the hospital as assistant in 1882. Karewski had begun to do research work while still a student. In 1882, he was awarded a prize for research on "The Influence of Puerperal Secretions on the Animal Organism from the Basis of Experimental Research." However, from 1883 on, his research work was entirely in the field of surgery. Since 1890, his publications have been almost confined to the surgery of children's diseases. In 1894, he published (Enke, Stuttgart) a textbook on the surgical diseases of childhood. Since that date, he has written many articles that deal entirely with the clinical aspects of surgery and open no new paths. Karewski was in much demand as a consultant. Many years ago, he contracted an incipient tuberculosis of the larynx. For nearly a year, he took a rest cure, the so-called *Schweigekur* (being prohibited from even speaking), spending part of the enforced vacation in the South, and recovered. His death was due to a malignant tumor.

Marriages

BENJAMIN LANDIS ELLIOTT, Kansas City, Mo., to Miss Helen D. Buell of Madison, Wis., October 26.

MONSEY E. MEASE, Sandy Level, Va., to Miss Annie Edwards of Lynchburg, October 13.

ALBERT S. PRIDDY, Madison Heights, Va., to Mrs. Mamie H. Mitchell of Alexandria, October 20.

ROBERT WILSON SELBY, Middleburg, Va., to Miss Mae Diller of Rehoboth Church, November 1.

CLIFFORD F. STUHLMUELLER, St. Louis, to Miss Marie Baum, of Hamilton, Ohio, November 27.

MARSHALL L. BOYLE, JR., Richmond, Va., to Miss Elise Leckie of Lynchburg, October 20.

ROBERT MINOR BAKER to Mrs. Ruby Gornto Jones, both of Jacksonville, Fla., October 18.

KENNETH BULKLEY to Mrs. Arthur Gosling, both of Minneapolis, in November.

WILFORD F. WIDEN, Minneapolis, to Miss Ruth Martin of St. Paul, September 8.

HARRIS R. SUTTON to Miss Clara Stock, both of Hoffman, Minn., in October.

Deaths

Warren A. Dennis ⊕ St. Paul; University of Minnesota Medical School, Minneapolis, 1896; associate professor of surgery at his alma mater; member and at one time secretary of the Western Surgical Association; veteran of the Spanish-American and World wars; formerly on the staffs of the State Hospital for Indigent, Crippled and Deformed Children; the City and County, St. Luke's and St. Joseph's hospitals, and the Miller Hospital, where he died, November 8, of pneumonia, aged 53.

Joseph Davis Craig ⊕ Albany, N. Y.; Albany Medical College, 1884; curator of the museum, and for thirty years professor of anatomy, at his alma mater; member of the American Association of Anatomists; formerly president of the Albany County Medical Society; on the staff of the Albany Hospital since 1894; city health officer 1900-1914; aged 67; died, November 5.

John Raymond Vincent Wolfe, Norristown, Pa.; Jefferson Medical College of Philadelphia, 1911; member of the Medical Society of the State of Pennsylvania; served in the M. C., U. S. Army, during the World War; on the staff of the Montgomery Hospital; aged 42; died, November 17, following an appendectomy.

Charles Franklin Smith ⊕ Muskegon, Mich.; Baltimore (Md.) Medical College, 1898; director of the department of health and welfare; formerly city health officer; served in the M. C., U. S. Army, with the rank of captain, during the World War; aged 50; was found dead in his home, November 9.

Antoine E. Bonneville, Alpena, Mich.; University of Paris, France, 1875; Medical Department of the University of the City of New York, 1891; member of the Michigan State Medical Society; aged 68; died, November 3, of injuries received in an automobile accident.

Harry Rabe Sharpe ⊕ Manchester, Conn.; University of Vermont College of Medicine, Burlington, 1900; member of the school board; aged 44; died, November 12, at the Manchester Memorial Hospital, South Manchester, of embolism following an appendectomy.

Charles Henry Esdorn, Walterboro, S. C.; Medical College of the State of South Carolina, Charleston, 1901; member of the South Carolina Medical Association; past president of the Colleton County Medical Society; aged 43; died, November 13, of heart disease.

Elgin Orange Bingham, Niagara Falls, N. Y.; Trinity Medical College, Toronto, Ont., Canada, 1892; acting assistant surgeon, U. S. Public Health Service, on duty at the U. S. Immigration Station; aged 56; died, October 20, of mitral regurgitation.

Henry Samuel Myers, Forks of Buffalo, Va.; Medical College of Virginia, Richmond, 1892; member of the Medical Society of Virginia; formerly state senator; aged 56; died, November 2, of a self-inflicted bullet wound while suffering from ill health.

Jacob Lang, Milwaukee; University of Leipzig, Germany, 1877; member of the State Medical Society of Wisconsin; formerly on the staff of the Passavant, now the Milwaukee, Hospital; aged 85; died, November 10, of senility.

Albert John Adams Hamilton ⊕ Boston; University of Pennsylvania School of Medicine, Philadelphia, 1906; formerly on the staff of the Carney Hospital; aged 44; was found dead, November 7, of cerebral hemorrhage.

Henry Edward Reece ⊕ Lawrence, Kan.; University Medical College of Kansas City, Mo., 1900; served in the M. C., U. S. Army, in France, during the World War; aged 46; died suddenly, November 9, of mitral regurgitation.

Norman Michael Grace, Arnprior, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1915; served during the World War with the Canadian Army Medical Corps; aged 30; died, October 21, of pneumonia.

John James Sullivan, Philadelphia; Jefferson Medical College of Philadelphia, 1923; served during the World War; on the staff of St. Agnes' Hospital, where he died, November 11, of pulmonary tuberculosis, aged 29.

James Wiley Knowlton, Birmingham, Ala.; Vanderbilt University Medical Department, Nashville, Tenn., 1883; member of the Medical Association of the State of Alabama; aged 66; died, November 4, of angina pectoris.

⊕ Indicates "Fellow" of the American Medical Association.

William Martin Reed ⊕ Kansas City, Mo.; Louisville (Ky.) Medical College, 1896; member of the American Academy of Ophthalmology and Oto-Laryngology; aged 57; died, November 2, of heart disease and influenza.

Percival Orison Hopkins ⊕ Bingham, Me.; Medical School of Maine, Portland, 1901; served in the M. C., U. S. Army, during the World War; aged 48; died, October 11, at the Somerset Hospital, Skowhegan.

James Dix Turner, Chapmanville, W. Va.; University of the South Medical Department, Sewanee, Tenn., 1900; aged 49; was killed, November 12, when the automobile in which he was driving overturned.

Frank Godfrey Hornung, Hamilton, Ohio; Medical College of Ohio, Cincinnati, 1891; member of the Ohio State Medical Society; aged 75; died, November 6, at the Mercy Hospital, following a long illness.

Carl Wood Hoopes, Marysville, Ohio; Starling Medical College, Columbus, 1905; member of the Ohio State Medical Association; for four years city health commissioner; aged 43; died, November 9.

William Perry Robinson, Haverhill, Mass.; University of Vermont College of Medicine, Burlington, 1874; member of the Massachusetts Medical Society; aged 73; died, October 30, at the Hale Hospital.

Stoughton R. Wheeler, East Bloomfield, N. Y.; University of Buffalo (N. Y.) Department of Medicine, 1886; member of the Medical Society of the State of New York; aged 62; died in October.

Guy Jenkins Mulvane ⊕ Topeka, Kan.; College of Physicians and Surgeons, Keokuk, Iowa, 1878; on the staff of Christ's Hospital; aged 73; died, November 4, of mitral regurgitation.

Alpheus Wood Disosway, Columbia, N. C.; University of Maryland School of Medicine, Baltimore, 1905; aged 41; died at a hospital in Washington, as the result of bullet wounds, November 2.

Samuel Duff Hartman ⊕ Tippecanoe City, Ohio; University of Michigan Medical School, Ann Arbor, 1872; Civil War veteran; aged 77; died, November 4, following an operation.

Joseph M. Swope, Arenzville, Ill.; University of Louisville (Ky.) Medical Department, 1880; member of the Illinois State Medical Society; aged 69; died, November 11, of heart disease.

Emilie Louisa Gnekow, Stockton, Calif.; Northwestern University Woman's Medical School, Chicago, 1901; member of the California Medical Association; aged 51; died, October 4.

John Clarkson Jay, New York; Medical Department of Columbia College, New York, 1865; Civil War veteran; aged 79; died, November 7, of heart disease, following an operation.

Henry Richard Pearce, Battle Creek, Mich.; Trinity Medical College, Toronto, Ont., Canada, 1897; member of the Michigan State Medical Society; aged 57; died in October.

J. P. Moon, Cordova, Ala.; Chattanooga (Tenn.) Medical College, 1899; member of the Medical Association of the State of Alabama; aged 49; was shot and killed, November 5.

John Hewitt Dawley, Laona, Wis.; Western Reserve University School of Medicine, Cleveland, 1879; formerly county judge; aged 69; died, November 10, following a long illness.

William Elwood Powell, Philadelphia; Medico-Chirurgical College of Philadelphia, 1894; member of the Medical Society of the State of Pennsylvania; aged 67; died, November 5.

Joseph C. Hunter, Antelope, Mont.; University of Pennsylvania School of Medicine, Philadelphia, 1873; aged 75; died in October, following an operation for carcinoma.

Charles N. Howard, Sr., Cusseta, Ga.; University of Georgia Medical Department, Augusta, 1867; Civil War veteran; aged 79; died, November 5, of heart disease.

Joseph Graves Priestley, Lockeford, Calif.; Missouri Medical College, St. Louis, 1880; aged 66; was instantly killed, November 9, in an automobile accident at Livermore.

Samuel Latimer Phillips, Savannah, Ga.; University of Maryland School of Medicine, Baltimore, 1885; aged 69; was found dead, November 2, of heart disease.

Olin Joseph Lawry, Redding, Calif.; Rush Medical College, Chicago, 1875; Civil War veteran; at one time mayor of Redding; aged 79; died, November 6, of senility.

Walter A. Guidinger ⊕ Long Beach, Calif.; Chicago College of Medicine and Surgery, 1907; formerly a practitioner in Nebraska; aged 42; died, September 18.

Albert Ernest Finley, Elgin, Manitoba, Canada; University Manitoba Faculty of Medicine, Winnipeg, 1904; aged 53; died, October 4, of cerebral hemorrhage.

George G. Topping, Denver; Jefferson Medical College of Philadelphia, 1872; formerly a practitioner in Ohio; aged 79; died, recently, of cerebral hemorrhage.

Henry B. Erdhaus ✠ St. Louis; Barnes Medical College, St. Louis, 1906; aged 59; died, October 29, following an operation for intestinal obstruction.

W. M. Brooks, Stanberry, Mo.; American Medical College, St. Louis, 1878; member of the Missouri State Medical Association; aged 75; died recently.

Charles W. Cornelius, Portland, Ore.; University of Oregon Medical School, Portland, 1889; formerly county coroner; died, November 1, of neuritis.

Joseph Frederick Berg, Plainfield, N. J.; Jefferson Medical College of Philadelphia, 1862; Civil War veteran; aged 83; died, November 3, of senility.

Claude A. Roberts ✠ Solomon, Kan.; St. Louis (Mo.) College of Physicians and Surgeons, 1900; aged 52; died, November 13, of pernicious anemia.

Charles Clemenceau Fremont Nieschang ✠ Fort Wayne, Ind.; Fort Wayne College of Medicine, 1882; aged 63; died, November 4, of pancreatitis.

Luther B. Bushong ✠ Topeka, Kan.; University Medical College of Kansas City, Mo., 1897; aged 53; died, November 15, of cerebral hemorrhage.

Enoch Blackburn Ketcherside, Yuma, Ariz.; University of Tennessee College of Medicine, Memphis, 1884; aged 77; died, October 25, of senility.

Walter M. Ford, Mount Auburn, Ind.; University of Louisville (Ky.) Medical Department, 1877; aged 71; died, November 7, of heart disease.

John Z. Ferrell, Dallas, Texas; University of Georgia Medical Department, Augusta, 1881; aged 64; died, October 27, of pneumonia.

William M. Stewart, Terrell, Texas; University of Louisville (Ky.) Medical Department, 1881; aged 73; died, November 9, of pneumonia.

James Olland McCorrison, North Berwick, Maine; Medical School of Maine, Portland, 1878; aged 72; died, October 12, of diabetes mellitus.

Fred A. Hanson, Burnside, Ill.; Chicago College of Medicine and Surgery, 1909; aged 44; died, November 6, of pernicious anemia.

June Abbott, Batesville, Ind.; Eclectic Medical Institute, Cincinnati, 1872; Civil War veteran; aged 79; died, November 4, of senility.

W. H. H. Stewart, Atlanta, Ga.; University of Georgia Medical Department, Augusta, 1873; aged 83; died, November 11, of senility.

Hugh C. Jones, Searcy, Ark. (licensed, Arkansas, 1903); formerly member of the state legislature; aged 75; died, November 5.

Joseph Addison Trimble, Nashville, Tenn.; Vanderbilt University Medical Department, Nashville, 1881; aged 67; died, November 14.

Mary A. Baird, Albany, Ind.; Eclectic College of Physicians and Surgeons, Indianapolis, 1893; aged 66; died, November 3.

Joseph Edwards Midgley, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1886; aged 60; died recently, at Beaumaris.

John Sellman Edwards, Erin, Tenn.; Vanderbilt University Medical Department, 1876; aged 72; died, November 8, of senility.

Frank W. Johnson, Cincinnati; Columbus (Ohio) Medical College, 1892; aged 57; died, November 10, following a long illness.

William Eugene Putnam ✠ Whiting, Ind.; Rush Medical College, Chicago, 1889; aged 62; died suddenly, November 19.

J. M. Graves, Dycusburg, Ky.; Kentucky School of Medicine, Louisville, 1877; aged 74; died, November 3, of senility.

George T. Gray, Lyons, Ga.; University of Georgia Medical Department, Augusta, 1888; aged 62; died, November 5.

John T. Dickey, Howard, Ga.; Louisville (Ky.) Medical College, 1872; aged 75; died, November 6, of senility.

E. A. Swepston, Myrtle Springs, Texas (years of practice); aged 71; died, November 2.

Correspondence

"PROTEIN AND PELLAGRA"

To the Editor:—I regret that only just now have I had the opportunity of making myself acquainted with Dr. Goldberger's reply to me (THE JOURNAL, June 23, 1923, p. 1866). Dr. Goldberger writes:

"In this table as Hindhede presents it, the consumption of the foods of his 'Group 1' in pellagrous households with two or more cases is given in the rate at 675 gm.; it should be 583 gm. per person, so that this represents not 2,800 but 2,100 calories, and therefore 64 per cent. and not (as Hindhede states) 90 per cent. 'of the nourishment' of the members of such households."

Yes, there is a typographical error—my own oversight; 675 should be 575 ($351 + 9 + 5 + 6 + 144 + 32 + 22 + 6$). But the calories are quite correct (*Pub. Health Rep.* **35**:675 and 679 [March 19] 1920). Under the vitamin free "Group 1" I class:

	Calories
Flour, bread, cakes, etc.	1,840
Sugar, syrup, etc.	217
Salt pork, lard, etc.	745
	2,802

These are Dr. Goldberger's own figures. How he arrives at 2,100 I cannot imagine.

Dr. Goldberger writes also: "In the light of these studies it seems to us possible that the protein of 'whole bread' and of 'fruits, vegetables and potatoes,' even though small in amount, may be adequate in itself or, more likely, may serve as an efficient supplement." I am much surprised. This is what I myself might write, word for word. But I am unable to understand that it is the same Dr. Goldberger who wrote: "Relation of pellagra incidence to variations in supply of 'animal protein' foods" (*Pub. Health Rep.* **35**:681 [March 19] 1920) and who concluded by saying (p. 707):

"The indications afforded by this study clearly point to an increase in the availability of milk, particularly by increasing cow ownership, and of fresh meat by all-year-round meat markets as important practical measures of prevention and control in communities of the character studied." Dr. Goldberger in this place did not recommend "whole bread, fruits, vegetables and potatoes."

If the colleges would take the trouble to read the report mentioned, they surely would find that Dr. Goldberger has changed his mind, which of course can only gratify me. I hope that McCollum and others have done the same.

M. HINDHEDE, M.S., Copenhagen, Denmark.

LONG LIFE IN THE SOUTHERN MOUNTAINS

To the Editor:—Are the southern mountains a healthful place in which to live? Much has been said and written about poverty, poor medical care, lack of proper attention to childhood, and various other matters classed as hardships which people who live in the remote parts of the mountains have to endure. But in contrast to these things one should dwell on the advantages which life in the mountains has to offer. There are hardships in places, but there are also rewards worth living for: pure air, excellent spring water, the simple life, absence of noises that infest our cities, neighbors with whom one can get acquainted, friends who will help in time of sickness and bring comfort in days of sorrow, gorgeous sunsets and glorious sunrises undimmed by smoke from flues and factory chimneys, scenery whose lights and shadows vary through each hour of the day, an opportunity to go to bed early and sleep through all the night, no fear of burglaries, freedom from the restraint of multivarious city street

regulations, and the feeling that one is free to go and come as one chooses.

During a recent inquiry among seventy-five students from the mountain country of Kentucky, West Virginia, Virginia, North Carolina and Tennessee concerning the number of persons personally known to them whose ages are or were at the time of their death above 90, forty-four people were reported with ages varying from 91 to 110 years, and five over that age, many of them living now and in excellent health.

Of twenty-two persons reported over 100 years old, sixteen were from the Kentucky mountains. Seven of these were negroes. When it is remembered that in most parts of the Kentucky mountains there are exceedingly few negroes, some counties having none at all, the proportion of negro centenarians appears unusually large. Negroes, as a rule, live the most simple kind of life, eat the simplest kinds of food, have the most unpretentious living quarters, receive the minimum medical attention, and are farthest behind in the struggle for large fortunes.

Is it not true that those who live thus and do the hardest kinds of manual labor are destined to reach the ripest old age?

JOHN F. SMITH, Berea, Ky.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

INCREASING THE COAGULABILITY OF THE BLOOD

To the Editor:—Before every tonsil operation on an adult, I make a test to ascertain the coagulation time. If the blood coagulates in a time over eight minutes, I give a dose or two of some of the agents that are prepared for hypodermic use to increase the coagulability of the blood, such as thromboplastin or similar substances, and I think that I have seen this decrease the coagulation time. On the whole, however, these things have been disappointing; and after hemorrhage has begun, so far as my observation has gone, they are perfectly useless. Please let me know the best means known to increase the coagulability of the blood.

A. J. KEMP, M.D., Miami, Fla.

ANSWER.—There is no completely efficient method to increase the coagulability of the blood when low. This is because delayed clotting may be due to deficiency in any one of the several essential factors in clot formation; and the proper therapy consists in restoring the missing factor, or removing the inhibiting influence. Thus, in diseases in which there is a blood platelet deficiency, as in certain forms of purpura, introduction of blood platelets by means of blood transfusion is probably the most efficient restorative. When there is a calcium deficit, intravenous injection of calcium salts would be required. Brain lipoid and solution brain extract which are described in New and Nonofficial Remedies rank quite high as accelerators of clotting in experimental observations on animals. That it may fail under certain abnormal conditions is to be expected. In jaundice, for instance, in which condition the bile seems to interfere with the conversion of fibrinogen into fibrin even in the presence of an abundance of thrombin, it is probably useless.

LIQUID PETROLATUM AS A LAXATIVE

To the Editor:—Does liquid petrolatum, when used as a laxative, tend to protect the food against the action of the digestive fluids, or why do certain persons who use it daily lose weight? Please do not publish my name.

M.D., Ohio.

ANSWER.—Liquid petrolatum should not be put into a category with animal or vegetable fats, as they have nothing in common except certain physical properties and solubilities. Liquid petrolatum is bland, odorless, tasteless, colorless and indigestible, as well as insusceptible of decomposition by bacteria; hence it cannot become rancid. It is not absorbed; therefore it cannot produce poisoning in any dose. A pint of liquid petrolatum has been given in a few hours without untoward results (Fantus, Bernard: Useful Cathartics, Chicago, American Medical Association, 1920, p. 31). The action of such a substance on digestion will obviously depend in part on the dose used. In ordinary quantities it does not seriously impair the alimentary efficiency. Like all laxatives used in very large quantities, liquid petrolatum may diminish the degree of utilization of food by promoting evacuation before the functions of digestion and absorption can be entirely completed. It is conceivable that in this way an occasional person might lose weight through failure to absorb an adequate diet. This presumably is at most an unusual outcome. Fantus has pointed out that as the liquid petrolatum, when taken after meals, is likely to lie heavy on the stomach and produce other gastric distress — in Bastedo's investigation 20 per cent. complained of nausea or tendency to repeat—it is best to take it in such a way that it will interfere least with gastric digestion. This is secured by giving a dose, from 15 to 60 c.c., at bedtime, or else administering 15 c.c. one hour before each meal.

In reporting on a proprietary brand of liquid petrolatum widely exploited to the public (Report Council Pharm. & Chem., 1918, p. 72), the Council on Pharmacy and Chemistry warned that constipation should be treated by dietary and hygienic means as evacuants are but temporary measures. It further cautioned that liquid petrolatum is medicinal: it modifies greatly the intestinal flora; it acts as a lubricant and emollient; it modifies the absorptive powers of the intestinal mucous membrane; it is capable of influencing the digestion of fats; and, in short, liquid petrolatum is a drug, the indiscriminate and excessive use of which should not be encouraged.

SPAHLINGER TREATMENT FOR TUBERCULOSIS

To the Editor:—Can you give me information on tuberculin treatment by Henry Spahlinger, Swiss bacteriologist?

STEPHEN V. MOUNTAIN, M.D., Olean, N. Y.

ANSWER.—A note appeared on the Spahlinger treatment in THE JOURNAL, Oct. 7, 1922, page 1263. Since this was published, the nature of the products has been made public, and reports on them have been published in medical journals. The treatment, however, is still deemed to be in the experimental stage.

Henry Spahlinger, a resident of Geneva, received medical training, but took his degree in law. Later he abandoned law for research work.

The Spahlinger treatment, as revealed at present, makes use of vaccine and serum therapy. The theory from which the treatment is evolved is that the tubercle bacillus emits different toxins under varying conditions of temperature, environment, etc. Many of these are claimed to be isolated as either exotoxins or endotoxins. The time required to make a vaccine is from nine to ten months, and the vaccines—of which there are said to be about twenty—are used for prophylaxis, for treatment of the milder cases of tuberculosis, and for the production of the various serums, which are in turn employed in the treatment of the more severe cases of tuberculosis. Each isolated toxin is injected into a separate horse until immunity results. The serums, varying in degree of virulence according to the toxins used for their production, are then mixed to form a complete serum—a process requiring about four years for completion. Owing to extreme financial difficulties, Spahlinger is said to have none of the complete serum at the present time.

Recently reports appeared in British medical journals stating that the British ministry of health is prepared actively to encourage the experimental trial of the Spahlinger preparations under scientific supervision as soon as a sufficient supply of the remedy is available. The British Red Cross has gone so far as to vote a sum of £30,000 to enable Spahlinger to work on a larger scale so that the treatment may be tried in England.

The reports in regard to the efficacy of the preparations which have appeared in the British medical journals are conflicting, and the Red Cross organization has made it clear that the products are in the experimental stage.

The Medical Expert Witness.—The physician as an expert witness in court should be as scrupulously careful, honest and scientific as he would be if he were expressing his opinion before a body of medical men. Very many expert opinions that have been given by physicians in court would be ridiculed and hooted as scientifically foolish at a medical meeting. Too many medical men as expert witnesses have the wrong idea that the examining counsel is a fool or that the jury and the court are simpletons. —Geo. W. Whiteside, *New York State J. M.* **23**:74 (Feb.) 1923.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALABAMA: Montgomery, January 8. Chairman, Dr. Samuel W. Welch, Montgomery.

COLORADO: Denver, January 8. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DELAWARE: Wilmington, December 11-13. Sec., Reg. Bd., Dr. P. S. Downs, Dover; Sec., Homeo. Bd., Dr. H. W. Howell, 824 Washington St., Wilmington.

INDIANA: Indianapolis, January 8. Sec., Dr. W. T. Gott, State House, Indianapolis.

KENTUCKY: Louisville, December 11. Sec., Dr. A. T. McCormack, State Board of Health Bldg., Louisville.

LOUISIANA: New Orleans, December 13-15. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MARYLAND: Baltimore, December 11-14. Sec., Dr. J. McP. Scott, 141 W. Washington St., Hagerstown.

NORTH CAROLINA: Chapel Hill, December 4. Sec., Dr. Kemp P. B. Bonner, Raleigh.

NORTH DAKOTA: Grand Forks, January 1-4. Sec., Dr. G. M. Williamson, 860 Belmont Ave., Grand Forks.

OHIO: Columbus, December 5-7. Sec., Dr. H. M. Platter, Hartman Hotel Bldg., Columbus.

OREGON: Portland, January 2-4. Sec., Dr. Urling C. Coe, Stevens Bldg., Portland.

VIRGINIA: Richmond, December 11-14. Sec., Dr. J. W. Preston, McBain Bldg., Roanoke.

WASHINGTON: Olympia, January 8. Sec., Mr. William Melville, Olympia.

WISCONSIN: Madison, January 8-10. Sec., Dr. J. M. Dodd, 220 E. Second St., Ashland.

PUBLIC HEALTH COURSES IN MEDICAL SCHOOLS

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NEW HAVEN, CONN.

The Council on Medical Education and Hospitals of the American Medical Association publishes each year valuable data regarding medical education in the United States. These reports describe the graduate courses in public health in the few medical schools in which such courses are given (eleven in 1922), but do not aim to furnish information regarding the extent of public health teaching in the regular medical curriculums. The present report, which has been prepared at the request of Prof. C.-E. A. Winslow, chairman of the Committee of the American Public Health Association on Standardization of Public Health Training, is based on a study of the public health courses given to medical undergraduates in fifty-seven Class A medical schools of the United States, as described in the 1922-1923 bulletins of these institutions and supplemented by correspondence. Medical schools that give only the first two years of the course have been omitted. I gratefully acknowledge the cooperation of the officers of the college, who have made this study possible.

It may be stated, at the outset, that the curriculum prescribed by the Association of American Medical Colleges, according to the schedule furnished me by the secretary, calls for from 3,600 to 4,400 hours in four calendar years, distributed as from 900 to 1,100 hours a year and grouped in nine main divisions. The division of hygiene and sanitation is allotted from 3 to 4 per cent. of the total hours, or from 108 to 176 hours for the entire course. This is the smallest allotment of the nine, comparing most closely with the 3.5 to 4.5 per cent. suggested for biochemistry, and the 4 to 5 per cent. each for the two divisions of pharmacology, and obstetrics and gynecology, while general medicine rightly receives the highest allotment of 20 to 26.5 per cent. This amount of time is considerably greater than that specified in the earlier schedule,[1] published in 1922, in which the subject of preventive medicine and public health appeared as a subdivision of pathology and bacteriology and was alloted a minimum of 1.5 per cent. of the total time.

A study of the required public health courses given in the different medical schools of the United States suggests the need for better organization and standardization of these courses, based on sound principles of pedagogy and public health. While a few medical schools give really comprehensive courses in preventive medicine to their medical students, several others apparently fall short even of the minimum standards suggested by the Association of American Medical Colleges. Some of the schools emphasize "the practicing physicians' duties and opportunities in the field of preventive medicine" (Stanford), "in regard to personal and community hygiene and the causes, general nature and control of preventable diseases" (Louisville), and "to stimulate within the mind of the student the public health consciousness, together with practical and scientific methods of applying the same" (Howard). The whole matter of more public health work for medical students has recently been the subject of inquiry in a few institutions, and special committees on curriculum have been appointed to consider the situation.

NUMBER OF COURSES

Most of the medical schools give only one prescribed course in public health to medical students, although eight of the schools have two courses, five have three courses, and two have four courses. Whenever more than one course is given, however, the subject matter and total hours usually correspond to subdivisions of the single courses which are more common. Fourteen institutions offer elective courses in public health, chiefly to fourth year men and often involving practical field work or research. One medical school (Ohio) reports an optional course to sophomore students in personal hygiene, which is taken by about five sixths of the class each year. This institution, among others, also offers special courses in public health to medical students and nurses with advanced standing, and a number of them are taken by the prospective medical students during the preliminary college years. At Columbia, electives are given in practical field work in prenatal, infant, preschool and school groups, and psychiatric work for children; and about one third of the fourth year class availed themselves last year of these elective courses. A large part of the public health aspects of maternity and infancy is carried by the department of obstetrics and pediatrics. Undoubtedly, the interest of the medical student in public health fields will grow as increased opportunity for elective work is given.

SCOPE OF COURSES

The prescribed public health courses given to medical students consist, for the most part, of lectures and demonstrations, although twenty institutions report only lectures, varying in total number from eight in Boston University to 110 in Long Island College Hospital, with a median of thirty-four in Tufts Medical School and the University of Nebraska. One exception should be made to this statement in the case of an institution whose bulletin reports a department of pathology, bacteriology and preventive medicine, but fails to indicate any separate course in preventive medicine. Considering the entire group of medical schools, it is found that the total number of hours given to public health courses ranges from no special course in one school, and eight hours in Boston University as previously indicated, twenty-two hours in Johns Hopkins and twenty-four hours in Ohio, to 149 hours in the University of Georgia, over 150 hours in the University of Buffalo, 156 hours in Syracuse, 160 hours in Western Reserve, and 210 hours in Tulane, with a median of sixty-one hours in the University of Minnesota. Table 1 indicates the type of courses given and the amount of time required for the work.

1. Medical Education in the United States, J. A. M. A. **79**: 629 (Aug. 19) 1922.

As shown in the table, most of the courses are given in the third or fourth years. Public health courses are given in the second year in eighteen schools, but in ten of them such courses are only preliminary hygiene courses leading to more advanced work in preventive medicine in succeeding years. In the fourteen schools in which more than one public health course is given, the first is usually limited to general hygiene, while later courses deal more particularly with public health and administration. In the Woman's Medical College of Pennsylvania, instruction in hygiene and disease prevention consists in one lecture a week through one semester for each

TABLE 1.—*Public Health Courses Given in Medical Schools Classified by Year Given, Type of Course, and Total Hours, 1922-1923*

Year Given	Total Schools	Type of Courses						Total Hours		
		Lectures Only	Lectures and Field Work	Lectures and Laboratory	Lectures and Conferences or Quizzes	Lectures, Laboratory and Field Work	Lectures, Conferences, Laboratory and Field Work	Less than 54	54 to 80	Over 80
2	8	2	1	1	1	2	1	2	4	2
3	20	8	3	3	0	2	4	6	5	9
4	14	4*	5*	1	3	0	1	9	2	3
1, 2, 3 and 4	1	1	0	0	0	0	0	0	0	1
2 and 3	4	2	1	0	0	1	0	0	3	1
2 and 4	2	1	1	0	0	0	0	2	0	0
3 and 4	4	2	2	0	0	0	0	0	3	1
2, 3 and 4	3	0	0	0	0	2	1	0	1	2
No regular course	1	0	0	1	0	0	0	1	0	0
Total	57	20	13	6	4	7	7	20	18	19

* Given in the sixth year in the universities of Nebraska and Oregon.

of the four classes. In three universities, Arkansas, Buffalo and Western Reserve, instruction in hygiene and sanitation begins in the sophomore year and extends through the junior and senior years. In the first case, approximately sixteen hours are given to laboratory work, and thirty-two hours to hygiene lectures, while a sanitary survey occupies as much time as is necessary in the senior year. The courses in Buffalo consist of lectures, quizzes, laboratory work and field work, amounting to sixty hours in both the second and third years and thirty hours in the fourth year. In Western Reserve, didactic and field work total forty-eight hours, laboratory, sixty-four hours, and clinical hygiene or observation trips, forty-eight hours. The University of Michigan gives a required hygiene course of three lectures a week to sophomore students in the second semester, and a lecture course in preventive medicine amounting to two hours a week during the first semester of the junior year. One lecture course of twenty-two hours in hygiene and epidemiology is required in the third year at Johns Hopkins, while a thirty-eight hour course, consisting of lectures, conferences, laboratory and field work in preventive medicine and hygiene, is required at Harvard. A course in public health administration, consisting of thirty-two hours of lectures and conferences, is required of fourth year students at Columbia. Students are assigned, in groups of two or three, major topics in the field of preventive medicine, which they work up through study and reading, and report on in detail to the class, sustaining their statements in open discussion with the rest of the class. The course in preventive medicine at Syracuse involves three classroom hours a week during the second semester (forty-eight), and 108 hours of field work given mornings during the last six weeks of the fourth year. Information available for eight medical schools in which the public health courses comprise laboratory and field work as well as lectures indicates that about half of the time is usually spent in lectures.

BEST YEAR FOR COURSE

Obviously, each school has its own individual problems to solve, and every one realizes many obstacles which must be confronted in the development of a well rounded program. It is clear that there is at present little uniformity in selection of the year for giving public health courses in different medical schools. This is apparently due to two causes: first, a difference of opinion as to the proper place for such courses, and second, lack of choice, due to the fact that the medical curriculum has been overcrowded and special courses in public health are comparatively new and in some cases have not yet become well established. Time and careful selection of teaching personnel will eventually bring about some adjustment of these problems as the principles of modern medicine become more generally realized. It seems essential at the outset that the first half of the course be designed to equip the physician as a hygienic adviser to the family, competent to deal particularly with the environmental factors that affect health. The second half should deal with the organized community health program and the relation of the physician to the work of official health agencies, infant hygiene, antituberculosis movements, medical supervision of school children and problems of industrial hygiene.

In order that the medical student may approach a comprehensive course in public health with the proper attitude, and consider broadly the complex problems involved, it is most important that he have a solid background with pathology, physiology and medicine as bases. In other words, he should be well equipped. Furthermore, in most of the medical schools at present, the medical student is just entering the wards in his third year. He finds this work more fascinating than attending public health lectures or taking field trips, which he is inclined to look on as outside his realm and so much time taken from what he is likely at this time to consider his real medical activities. It is most important, then, that the utmost care be exercised in arranging the year in which public health courses are given, as well as the particular hours in the day, in order that class and field work may interfere as little as possible with the students' clinical work. The fourth year in the average medical school seems to meet best these conditions, and offers the most satisfactory opportunity for demonstrating the important place of public health in modern medicine.

SANITARY SURVEYS

Practical field work and demonstrations to illustrate the underlying principles of public health are recognized as essential features of the instruction of medical students. Field work includes sanitary surveys in at least six medical schools,[2] in addition to elective work along the same line in a few other cases. These surveys are usually made in the senior year, through cooperation with state and city health departments. Of course, the value of sanitary surveys depends largely on the care given to the collection and analysis of data. If properly supervised and supported, they may benefit communities and students alike; but if performed in a haphazard or perfunctory manner, they are both time-consuming and worthless from an educational standpoint.

NAMES OF COURSES

The names of public health courses in different institutions vary considerably, as shown by Table 2, which includes the forty-two schools in which only one course is required.

This table indicates that in those institutions which require only one public health course of medical students, nearly half of these courses are given in the third year, and that

2. Arkansas, Buffalo, California, Creighton, Harvard and Syracuse.

"hygiene and preventive medicine" is the most common title, "hygiene" ranking second.

TABLE 2.—*Public Health Courses Given in Medical Schools Classified by Name, Number of Schools and Year Given, 1922-1923*

Name of Course	Total	Number of Schools and Year Given			
		2d	3d	4th	?
Hygiene	9	2	5	2	..
Hygiene and preventive medicine	13	3	8	2*	..
Hygiene and sanitation	1	0	0	1	..
Hygiene and dietetics	1	0	1	0	..
Hygiene and epidemiology	1	0	1	0	..
Preventive medicine	4	1	1	2	..
Preventive medicine, hygiene and sanitation	1	0	0	1	..
Public health	5	1	1	3†	..
Principles of public health	3	0	1	2†	..
Public health and hygiene	1	0	0	1	..
Public health administration	1	0	0	1	..
Public health and preventive medicine	1	0	1	0	..
No special course	1	0	0	0	1
Total	42	7	19	15	1

* Course given last part of third year and first part of fourth year in the University of California.
† Given in sixth year in the universities of Nebraska and Oregon.

GRADUATE COURSES IN PUBLIC HEALTH

Medical schools have extended considerably their elective and graduate work in public health during the past year or two. Graduate courses in public health are now offered in three or more institutions in addition to those mentioned in the report on medical education previously cited. In the University of Louisville, "The medical department, in cooperation with the school of public health of the university, is now giving medical students the option of elective senior courses with junior vacation field work in an organized health department. These courses, if sucessfully completed, will entitle them to a C.P.H. when they receive their diplomas in medicine. This qualifies the graduate for a position as health officer, and more completely fits him for the practice of medicine. On the completion of a fifth year, corresponding to a hospital internship, under the school of public health, these students may receive the degree of D.P.H."

Under the new elective system at Yale, it has been possible to arrange a special option in public health for students desiring to fit themselves for positions in the United States Public Health Service, in the administrative health service of states, counties and cities, and in the various voluntary organizations, local, national and international, which are devoted to the promotion of the public health. Students who elect public health courses as early as their second year and devote two months during the summer succeeding their third year to fourth year dispensary service and a large part of their fourth year to electives in public health may take the degree of Doctor of Public Health after one year of graduate study instead of the two years normally required. A somewhat similar plan is also offered at Johns Hopkins, among other places.

Several medical schools are extending their courses in public health, especially their graduate courses, frequently through the cooperation of city, county or state health officials, as in Georgia, where an intensive plan of community field work has recently been planned for public health students. By recent action of the board of regents, a new Minnesota department of preventive medicine and public health has been organized in the medical school which will be closely associated with the state board of health, the students' health service and the nonofficial health organizations of Minnesota.

While modern medical education has, for the most part, advanced hand in hand with modern medicine, and schools of medicine stand among the highest of the educational institutions, the important field of public health has, until very recently, been sadly neglected. Preventive medicine has been made possible through the advances in medicine as a science, but the call for medical leaders in this field was never more urgent than today. Dodson,[3] in his helpful discussion of the important part which the idea of prevention should play in the work of the individual practitioner, states that larger emphasis should be placed on prevention by every department in the school. According to information furnished by Dr. Haven Emerson, professor of public health administration at Columbia, it was ascertained by the administrative board of the faculty of that institution last year that 33 per cent. of the instruction given to medical students was directly contributory to the preventive aspects of medicine.

In an address delivered at the centennial celebration of the Medical College of the University of Cincinnati in November, 1920, the late Professor Sedgwick said:[4]

"The medical school which fails today to provide also liberal instruction in preventive medicine, in vital statistics, in sanitary science, in public health laboratory methods, in epidemiology; in preventive sanitation, such as the sanitation of water supplies and other branches of municipal sanitation; in preventive hygiene, such as mental, social, personal and dental hygiene; and in public health education and public health administration—that medical school is sending out its graduates unprepared for some of the most serious problems they will have to face in the immediate future."

"Obviously all these subjects cannot be injected into a curriculum already overcrowded. . . . That medical school which first begins this reformation will seize a golden opportunity."

Haythorn,[5] likewise, in considering the problem of preventive medicine in medical education, calls attention to the need for reviewing thoroughly the teaching courses in all departments, and urges that the teaching be carried out with a view to informing the student of the best preventive measure available, and directed toward preparing him for leadership in progressive health movements.

In a recent paper, Winslow[6] said:

"The first and most fundamental need in facilitating the recruitment of the public health service is the need for a better comprehension on the part of the medical undergraduate, the need for a radical change of atmosphere in the medical school itself. . . . The most important factor upon which we rely at Yale is a fundamental change in the atmosphere of the teaching in every branch of study throughout the four years. Dean Winternitz and the members of the medical faculty have outlined a policy which involves the centering of our whole university hospital around the dispensary and the centering of the dispensary around the health clinic; and each course, from pathology to pediatrics and medicine, is imbued throughout with a new idea, that the function of the physician is to promote health, and not merely to alleviate architecturally completed disease."

These efforts have already stimulated the students as well as instructors at Yale to investigate with a view to instituting preventive measures the sources of at least four different types of communicable diseases which have occurred in patients under their observation during the present school year.

Preventive medicine has come to stay, but it needs the active support of medical men who have been equipped in their medical schools for community leadership.

3. Dodson, J. M.: Preventive Medicine and the General Practitioner, J. A. M. A. **80**: 1 (Jan. 6) 1923.
4. Sedgwick, W. T.: Modern Medicine and the Public Health, Pub. Hecalth Rep. **36**: 109 (Jan. 28) 1921.
5. Haythorn, S. R.: The Problem of Preventive Medicine in Practice and in Medical Education, J. A. M. A. **80**: 885 (March 31) 1923.
6. Winslow, C.-E. A.: The Recruiting of Sanitarians for the Future Service of the State, Am. J. Pub. Health, May, 1923.

New Jersey June Examination

Dr. Alexander MacAlister, secretary, New Jersey Board of Medical Examiners, reports the written examination held at Trenton, June 19-20, 1923. The examination covered 9 subjects and included 90 questions. An average of 75 per cent. was required to pass. Of the 57 candidates examined, 45 passed, including 17 osteopaths, and 12 candidates failed, including one osteopath. Eighty-eight candidates were licensed by endorsement of credentials, including 7 osteopaths. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Yale University School of Medicine	(1920)		80.7
Georgetown University School of Medicine	(1922, 3)	80.7,	81.9, 85.9
Johns Hopkins University Medical Department	(1922)		86.6
University of Maryland	(1917)		84.1
Harvard University	(1912)		81.2
Hahnemann Med. Coll. and Hosp. of Philadelphia	(1921, 2)	81.5,	84.5
	(1922, 2)	78.9,	79.9
Jefferson Medical College	(1921)	78.8,	(1922, 3) 82.9, 84.6, 84.7
Univ. of Pennsylvania	(1920)	83.6,	(1921) 82.3, (1922, 3) 81, 85.6, 89.3
University of Vermont	(1922)		85
University of Freiburg, Germany	(1919)*	75.3,	(1922)* 83.2
National University of Athens, Greece	(1906)*		78.9
Faculty of Medicine, Guatemala	(1921)*		75
University of Naples, Italy	(1903)*	76.5,	(1916)* 75
University of Odessa, Russia	(1910)*		80.2
Osteopaths	75, 78.1, 78.8, 78.9, 79.3, 80.1, 80.1, 80.3,		81.7, 82.9,
	84.2, 84.3, 84.4, 85.6, 86.2, 87.1, 88		

College	FAILED	Year Grad.	Per Cent.
Hahnemann Medical College and Hospital, Chicago	(1885)		36.9
University of Naples, Italy	(1911)*	70.6,	(1914, 3)* 53, 61.8, 71.6,
	(1915)*	72.7,	(1916, 2)* 64.2,† (1919)* 72.7, (1921)* 72
University of Moscow, Russia	(1896)*		66.2
Osteopath			69.4

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement with
Denver College of Physicians and Surgeons	(1908)		Colorado
Central University of Kentucky	(1906)		Kentucky
Tulane University	(1916)	New York, (1921)	Louisiana
Johns Hopkins University Medical Department	(1920)		Maryland
University of Maryland	(1921)	New York, (1922)	Maryland
Harvard Univ.	(1916)	Illinois, (1919) New York, (1922)	Maine
University of Michigan Homeo. Med. College	(1914)		New York
Hamline University	(1897)		N. Dakota
University of Minnesota	(1922)		Minnesota
St. Louis University School of Medicine	(1921)		New York
Nebraska School of Medicine	(1896)		Mass.
University of Nebraska	(1922)		Nebraska
Albany Medical College	(1910),	(1920, 2), (1922)	New York
Bellevue Hospital Medical College	(1895)		New York
Columbia University	(1900),	(1917), (1920), (1921, 4)	New York
Cornell University Medical College	(1921)		New York
Fordham Univ. Sch. of Med.	(1913),	(1919), (1920), (1921)	New York
Long Island College Hospital	(1914),	(1917), (1921, 2)	New York
University and Bellevue Hosp. Med. College	(1906),	(1920), (1921), (1922, 10)	New York
Eclectic Medical College of Cincinnati	(1921, 2)		Ohio
Ohio Medical University	(1903)		Oklahoma
Hahnemann Medical Coll. and Hosp. of Philadelphia	(1898),	(1904), (1920)	Penna.
Jefferson Med. Coll.	(1909),	(1910), (1921) Penna., (1920)	N. Carolina
Medico-Chirurgical College of Philadelphia	(1898),	(1899), (1901), (1903), (1907), (1910), (1916)	Penna.
University of Pennsylvania	(1902)	Penna., (1918)	N. B. M. Ex.
Woman's Medical College of Pennsylvania	(1914),	(1915)	Penna.
Vanderbilt University Medical Department	(1917)		Maine
Baylor University College of Medicine	(1921)		New York
University of Vermont	(1921)	Vermont, (1921)	New York
Medical College of Virginia	(1909)	New York, (1912)	S. Carolina
University of Virginia	(1921)		New York
Queen's University Faculty of Medicine	(1918)		New York
University of Budapest, Hungary	(1917)*		New York
University of Rome, Italy	(1907)		Penna.
Osteopaths	Missouri, 4; Pennsylvania, 3		

* Graduation not verified.
† No grade given.

Maryland June Examination

Dr. J. McP. Scott, secretary, Maryland Board of Medical Examiners, reports the written examination held at Baltimore, June 19-22, 1923. The examination covered 9 subjects and included 90 questions. An average of 75 per cent. was required to pass. Of the 76 candidates examined, 74 passed and 2 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Howard University School of Medicine	(1923)		84
Johns Hopkins University	(1919)	85, (1921) 85, (1922, 2)	80, 85,
	(1923, 38)	76, 76, 78, 80, 81, 82, 82, 82, 83, 83,	
		83, 84, 84, 84, 84, 85, 85, 85, 85, 86, 86, 86, 86,	
		87, 88, 88, 88, 88, 88, 88, 89, 89, 89, 90, 90, 90,	
		90, 92	
University of Maryland	(1921)	84, (1922, 2) 79, 87, (1923, 20)	78, 78,
		78, 78, 79, 80, 81, 81, 81, 82, 82, 84, 85, 85, 86,	
		86, 86, 89, 90, 92	
Temple University Dept. of Medicine	(1922)	87, (1923)	81
University of Pennsylvania	(1921)	87, (1923)	80
McGill University Faculty of Medicine	(1921)		85
University of Toronto Faculty of Medicine	(1918)		82
University of Vienna, Austria	(1910)†		81
University of Zurich, Switzerland	(1914)		82

College	FAILED	Year Grad.	Per Cent.
Howard University School of Medicine	(1919)*	(1920)*	

† Graduation not verified.
* No grade given.

Book Notices

GUY DE CHAULIAC (A. D. 1363) ON WOUNDS AND FRACTURES. Translated by W. A. Brennan, A.B. Cloth. Price, $5. Pp. 153. Chicago: Published by the Translator, 1923.

Guy de Chauliac, generally known as the "Father of Surgery," was born in France in the last years of the thirteenth century. Like most of the surgeons of his time, he practiced under the patronage of a feudal lord. He studied in Montpellier, Bologna and Paris, and was physician to several of the popes, who conferred special dignities on him. When he compiled his great surgical textbook, copies were promptly made in various languages. The English edition was first published in 1541. The great work consists of seven parts, including anatomy, apostems, wounds, ulcers, fractures and dislocations, special diseases, and antidotes.

Mr. Brennan's text opens with the famous description of the qualities of a surgeon:

> The conditions necessary for the surgeon are four: first, he should be learned; second, he should be expert; third, he must be ingenious, and fourth, he should be able to adapt himself. It is required for the first that the surgeon should know not only the principles of surgery, but also those of medicine in theory and practice; for the second, that he should have seen others operate; for the third, that he should be ingenious, of good judgment and memory to recognize conditions; and for the fourth, that he be adaptable and able to accommodate himself to circumstances. Let the surgeon be bold in all sure things, and fearful in dangerous things; let him avoid all faulty treatments and practices. He ought to be gracious to the sick, considerate to his associates, cautious in his prognostications. Let him be modest, dignified, gentle, pitiful, and merciful; not covetous nor an extortionist of money; but rather let his reward be according to his work, to the means of the patient, to the quality of the issue, and to his own dignity.

In selecting from the complete text, Mr. Brennan has chosen wisely, giving a view of not only the surgical work such as ligature and suturing, but also bandaging and the application of drugs. The translation is simple and very well done.

THE MECHANICS OF THE DIGESTIVE TRACT. By Walter C. Alvarez, M.D., Assistant Professor of Research Medicine, George Williams Hooper Foundation for Medical Research, University of California Medical School. Cloth. Price, $3.50 net. Pp. 192, with 22 illustrations. New York: Paul B. Hoeber, 1922.

Written in a lucid and interesting style by a happy combination of laboratory worker and clinician, this splendid volume ought to appeal to both types of medical men. The text has three major subdivisions. In the earlier chapters, the author is concerned chiefly in minimizing the part played by the nervous elements of the bowel wall (Meissner's and Auerbach's plexus) in normal gastro-intestinal activity. In defense of his myogenic theory, he presents direct and indirect experimental evidence. He handles the affirmative side of the debate admirably. In the second division of the book, he proposes and supports, chiefly through his own laboratory work, the theory of gastro-intestinal gradients, according to which the tonus, irritability and rhythmicity of the smooth musculature of the gastro-intestinal tract decrease progressively from above downward. The gradient theory accounts for the orderly progress of material down the intestinal tract. Although Tashiro showed that nervous tissue produces carbon dioxid at a very high rate, and the author admits that the nerve net in the bowel wall becomes less voluminous from above downward, Alvarez concludes that the increased carbon dioxid output of the upper segments is due to the inherently higher rate of metabolic activity of muscle cells themselves. The higher catalase content of sections of the upper bowel (if such measurements mean anything at all) might be due likewise to the greater amount of nervous tissue in the walls

of the intestine as one proceeds from below upward toward the stomach. No one denies the possibility that under certain conditions smooth muscle or even striated muscle shows independent rhythmicity. Early in its development, the heart beat of *Limulus* has a myogenic origin; later in life, its rhythmic action is absolutely dependent on nervous tissue. The fact that the denervated *Limulus* heart muscle *will* beat rhythmically when "put in N/2 NaCl" is a phenomenon which has no bearing on the normal mechanism of the heart beat in the intact animal. In the third division of the book (Chapters IX and X) the author becomes highly speculative, and candidly admits it in the preface. These chapters deal with practical applications of the gradient idea and reserve peristalsis and its symptoms. In Chapter X, Alvarez discusses the factors which alter the normal gradient and which can then account for vomiting, regurgitation, heartburn, belching, nausea, coated tongue, and foul breath, globus, hiccup and biliousness—signs and symptoms resulting presumably from reverse peristalsis. The book has a chapter on objections and difficulties to the conception, and ends with a chapter on technical methods and apparatus found useful in his research. This chapter, with the bibliography (as well as the author and subject index) is particularly valuable to the laboratory worker in this field. The book is worthy of careful perusal and study by every internist and surgeon, and should certainly be on the shelf of every gastro-enterologist for ready reference.

WALTER REED AND YELLOW FEVER. By Howard A. Kelly, M.D. Third edition. Cloth. Price, $2.50. Pp. 355, with 15 illustrations. Baltimore: Norman, Remington Company, 1923.

The first edition of this book appeared in 1906. The present edition includes a life of General George M. Sternberg and of General Gorgas, as well as more recent experimental work on yellow fever, such as that of Noguchi and the attempts of the Rockefeller Foundation to eradicate yellow fever from the world. The early life of Dr. Reed is accumulated from personal documents, including letters and the reports of organizations, so that it is quite authentic. Moreover, Dr. Kelly has selected with rare judgment, so that the account is consecutive and interesting. The brief life of General Sternberg is based largely on the recent biography published by the American Medical Association. Dr. Kelly has apparently accepted wholly the work of Noguchi and *Leptospira icteroides*, which Noguchi isolated, although some parasitologists do not consider the causal relationship of this organism to yellow fever to have been absolutely established. The story of the conquest of yellow fever by medical science is one of the great epics of modern medicine. It is a story with which every medical student should be familiar, because it traced a path for the control of the many other infectious diseases. The account by Dr. Kelly is undoubtedly one of the best available.

THE CHEMISTRY OF LEATHER MANUFACTURE. By John Arthur Wilson, Chief Chemist, A. F. Gallun & Sons Company, Milwaukee. American Chemical Society Monograph Series. Cloth. Price, $5. Pp. 343, with 150 illustrations. New York: Chemical Catalog Company, Inc., 1923.

This should interest the layman who has had any scientific training, because of the history of leather manufacture and developments as a result of scientific investigative work. It contains much of value to the dermatologist because of its careful study of the histology of the skins of various animals used in the preparation of leather. There is a chapter on the chemical constituents of skin and the various stains used in micrographic studies.

ATLAS DER HAUTKRANKHEITEN. Von Hofrat Prof. G. Riehl und Prof. Leo v. Zumbusch. I. Teil: Infektiöse Hautkrankheiten. Paper. Price, 8 Swiss francs. Pp. 60, with 68 illustrations. Leipsic: F. C. W. Vogel, 1923.

The friendly reception given the appearance of the authors' syphilis atlas led them to begin the preparation of an atlas of skin diseases. The plates are beautifully printed from Uvachrom photographs but, as usual in color photography, the definition is not quite so sharp as in the black and white photographs. The atlas should be of considerable diagnostic aid to one not having access to a large amount of clinical material.

Miscellany

PEDIATRIC CLINICS IN CENTRAL EUROPE*

J. H. MASON KNOX, JR., M.D.
BALTIMORE
AND
JOHN B. MANNING, M.D.
SEATTLE

During a year spent in American Red Cross work on behalf of the children of several of the countries of eastern Europe, we had the opportunity to visit a number of universities and medical schools and to learn something of the courses offered and of the instruction given in pediatrics. An outline of the places in which the future pediatricians of the less familiar centers are trained should be of interest, for after all only a small proportion of the medical students in Latvia and Poland, for example, are able to go to Germany, France or England, and must depend on the instruction obtained in their own countries at the nearest schools and hospitals.

Our travels extended from the Baltic to the Adriatic, and included particularly the newly formed democracies of Esthonia, Latvia, Lithuania, Poland and Czechoslovakia, and the reduced and altered nations—Austria and Hungary.

ESTHONIA

Esthonia is in many respects the most enterprising of the three Baltic states. The native race comes from a sturdy stock related to the Finns, and its governing officials are a forward-looking group, familiar with the educational, health and philanthropic programs of other countries. The university center of the country is Dorpat, founded in 1632 by Gustavus Adolphus. As one walks about the beautiful rolling campus dotted with imposing buildings, it is easy to imagine oneself back in a university town in America. One meets at every turn groups of young students wearing the insignia of corps or class, and hears at night college songs much like those at home.

The pride of Dorpat is the university library, one of the most valuable in Europe, containing more than 500,000 volumes and many valuable manuscripts. These were all taken by the Bolsheviki to Russia, but returned a little worse for their travels after the peace of Riga. The university before the war was under Russian domination, but now the transfer to the Esthonian language as the vehicle of instruction is nearly completed, and there is a strong faculty in all departments. There are about 4,000 students, including over 700 in the courses in medicine.

Instruction in diseases of children is given in two semesters three times weekly. It is obligatory for all students in their fourth year. The lectures are in the form of clinics at which patients are examined by students and demonstrated to the class. Teaching material is obtained from a large outpatient department, a small children's hospital of twenty-five beds and an associated mothers' and infants' home. The department is conducted by Professor Lüüs, a man of ability who had made his special preparation in pediatrics in several of the best German clinics. Professor Lüüs cooperated with the American Red Cross in the most cordial manner in its child health program. He provided us quarters in his dispensary for our health center, and assigned his first assistant and several nurses to the work. This center, in connection with the nearby obstetric clinic, has become an important project, through which it is sought to reach all the expectant mothers and new-born children needing care in the city.

* Read at the meeting of the American Pediatric Society, French Lick Springs, Ind., May 31, 1923.

Visiting by the nurses in the homes of the children is now being carried on.

Through the work of the center, the students of this important medical clinic will become familiar with the standardized methods of maternity and child health activities, and will be equipped to start similar activities when they begin their practice throughout the country.

LATVIA

In Latvia, the government has taken over and reorganized the high school in its beautiful capital city of Riga into a university. Already there are 3,000 students, including about 600 in medicine. The courses in pediatrics are given by Professor Gärtje, a scholarly man trained in Petrograd. They consist of two courses of lectures and clinics—each occupying two semesters, and cover rather thoroughly the whole subject. Clinical material is obtained in an outpatient department and in the wards of a large memorial children's hospital. The students have opportunity to examine patients under the direction of instructors.

In Riga, in addition to a number of small children's clinics, in connection with the American relief kitchens, a large area of the city near an important city hospital was selected for an intensive demonstration in maternity and child health. To the center the names and addresses of new-born infants are reported daily, and the infants promptly visited in their homes. When the American Red Cross withdrew last July, there had been more than 500 expectant mothers registered and given prenatal care. In this prophylactic work we had the support and cooperation of both the obstetric and the pediatric department of the university medical school.

LITHUANIA

In Kovno, the present capital of Lithuania, which was accepted as such under protest when Poland seized Vilna, a university was started recently. There is no dearth of medical students, but the courses in pediatrics have not been formally opened, and as yet no pediatrician of special training has been engaged. There are several excellent hospitals in the city, including a large military hospital, which furnish clinical material.

POLAND

The first university visited in Poland was in Vilna—an old university center that had been suppressed for more than a hundred years by Russia; but now, under the patriotic leadership of a group of young professors, including several Polish Americans, conspicuous among whom is Dr. Retinger, a physiologic chemist from Chicago, old barrack buildings are being transformed into splendid lecture rooms and laboratories. A children's clinic with about fifty beds and a large outpatient department was about to be opened at the time of our last visit. As yet, a professor of pediatrics had not been chosen, nor was the outline of instruction in diseases of children completed. There are two admirable health centers for children, one Jewish and one Polish, in active operation in Vilna. Students throng all the classes; many of them are submitting to great physical hardships in their effort to secure an education.

At the University of Warsaw, there are said to be more than 8,000 students. Of these, 2,000 are in the medical department. The pediatric clinic is under the direction of Prof. M. Michaloniez. A full didactic and practical course is offered. There is a well equipped laboratory available for research workers. More than 200 students are taking major pediatrics.

The policlinic for children includes six examining rooms, a dental clinic, a roentgen-ray room, a large lecture hall and a ward containing fifty infants' beds. Instruction to students is also given at the Carl and Mary Children's Hospital in another part of the city. This hospital, which is an endowed institution completed just before the war, consists of an imposing group of buildings containing 100 medical and sixty surgical beds. The provision for isolation and care of contagious cases, both in the outpatient department and wards, is unusually elaborate. There are large laboratories for routine work and for investigation. Altogether, this hospital would compare favorably in equipment and facilities for the care of patients with any children's hospital in this country or elsewhere.

KRAKOW

One cannot enter the historic capital of Poland without a thrill. Here are the remains of the country's great men. The grass covered mound formed by handfuls of earth brought by patriotic devotees from all parts of Poland in memory of Kosciusko, the tomb of the hero soldier and that of Stanislaus, the patron saint of Poland, in the cathedral or the citadel, and the classic university quadrangle with the statue of Copernicus in the center, give the visitor the feeling that he is treading on sacred soil.

The University of Krakow is the second oldest in Europe, dating back to 1364. Here, too, students are pouring in. There are now about 5,000 men and women in all departments, including 600 enrolled in the medical school. The chair of pediatrics is occupied by Professor Lewkowicz. The usual courses of lectures and clinics are given. A large children's hospital furnishes the clinical material. At Krakow, assisted by members of the medical faculty, the American Red Cross organized a six months' course for nurses' aids to furnish assistants in the various health centers, because of the great dearth of nurses in Poland. These young women are proving invaluable in operating our program until the graduates of the splendid training schools in Posen and Warsaw are available.

At Lwow, the much fought over Lemberg of the war dispatches and the second city in size in the country, we found a splendid pediatric clinic under the direction of Professor Gröer, a friend and a fellow student of Pirquet.

The children's wards are small, but all cases are used for instruction and study. Especial attention is given to the method of forced feeding suggested first by Pirquet. It was difficult for us to believe the charts shown us of patients with severe ileocolitis, with many bloody stools daily, who had been carried through their illness to recovery without loss of weight. The nurses are all given especial instruction in the preparation of foods containing definite proportionate amounts of protein, fats and carbohydrates, and do the actual cooking for the patients themselves. Full courses in pediatrics are given during the third and fourth years. An active outpatient department is maintained.

Professor Gröer enthusiastically assisted in the establishment of intensive child health work in the portion of the city surrounding the clinic. An American nurse was the only addition to the personnel required.

CZECHOSLOVAKIA

As might have been anticipated under the administration of President Masaryk, himself a university professor, the government of Czechoslovakia is laying great emphasis on the value of education. Masaryk has publicly asserted that the policy he is most proud of in Slovakia is the establishment of 2,000 secondary schools. There are four universities with complete faculties, including that of medicine, in the country. The great difficulty is to provide adequately for the large numbers of students who are applying for admission.

In Prague, as is well known, there are two completely separate universities and medical schools, one under German and one under Czech direction. In the former, pediatrics is taught by Professor Longer and Professor Fischl, with a

number of assistants. Each professor gives five lectures or clinics a week. Bedside instruction is given at the German Children's Hospital and at a section of the large Foundlings' Home—made famous by Professor Epstein. A large policlinic is maintained, at which additional instruction is given. A correspondingly complete course in diseases of children is given in the Charles University Medical School by Professor Pesina and Professor Svehla.

The large Czech Children's Hospital and another section of the Foundlings' Home are used for clinical teaching. A course in the psychopathology of children is offered by Dr. Herford in the institute for feebleminded children.

The American Red Cross established several model child health centers in Prague, and secured the cooperation of both these faculties. Through these centers and others started elsewhere, twenty-one in all, 40,000 school children were given their first physical examination, and much corrective work was accomplished.

One of the great needs in the country is for a better standard of nursing. To help supply this deficiency, a training school has been started under American nurses, and two wards of the old general hospital have been turned over to the schools for the practical work of its students. The nursing care that the patients in these two wards receive has evoked great admiration from the visiting physicians. It was a well merited honor for the school that during a serious illness of President Masaryk some months ago, he sent for and was nursed by two American nurses.

Universities since the war have been started in Bruno, Moravia, and in Bratislava. In each of these a similar course in pediatrics is offered. The one in Bruno is under Dr. Teyschl, and that in Bratislava, under Professor Bedlik. Clinical instruction is given in Bruno in the children's department of the general hospital, and in Bratislava at the large children's clinic.

New university buildings are being erected at each of these newer schools, and some of the strongest members of the faculty at Prague are being sent temporarily to Bruno and Bratislava until the courses have become well established.

AUSTRIA

The pediatric clinics in Austria are so well known in this country that no extended description is necessary. There still remain in the country three important centers—Vienna with 4,000 medical students, Graz with 1,000 and Innsbruck with 700. All of these students are expected, but not required, to attend pediatric lectures half a year for their five years of study, which is equivalent to four and a half hours a week for a year. There seemed to be comparatively little opportunity for practical work. Women are admitted on the same terms as men.

The children's clinic at the university in Vienna was a busy place at the time of our visit. Especial attention was given to graduate instruction and to research under the direction of Pirquet and Schick. Miss Chick of England was just completing her important studies in rickets. An interesting feature of the clinic was the large class of children with incipient tuberculosis who were kept for long periods in a roof ward, in the fresh air and sunshine. The results of this treatment were said to be very striking. The preparation of the infant dietaries by the nem system was, of course, in vogue, but as we traveled away from Austria, this method of feeding seemed to have a diminishing number of adherents.

In the outpatient department is maintained one of the many child health centers conducted in Vienna with the assistance of the American Red Cross. At these stations and at the mothers and infants' home under the charge of Dr. Moll, there is opportunity for those students interested to become familiar with the best methods of infant and child care.

At Gratz it was a pleasure to renew our acquaintance with Prof. Franz Hamburger. His clinic of 200 beds is of older construction and is greatly in need of additional support. Important work is going on, however. We were shown, among other things, an interesting series of rachitic bone lesions being treated by violet rays.

The organization of the American Red Cross child health program in the province of Styrea is under Professor Hamburger's leadership.

HUNGARY

Pediatrics is taught in four universities of Hungary—in Budapest, Szeged, Debreczen and Pécs. In Budapest there are 5,000 medical students; in each of the others, about 700. In each of these schools all the students are required to take pediatrics—five one-hour lectures a week for one semester. It is proposed to increase the lectures to cover two semesters. There is little opportunity for the students to have practical work with patients. Women are admitted to all schools, but the number is restricted, and the entrance requirements are higher than for men. We were able to visit only the university clinic at Budapest. It was founded over eighty years ago by John Bokay, and is said to be the fourth oldest children's hospital in the world. The first Bokay was succeeded in the hospital and chair of pediatrics by his son, Janos Bokay, a genial and courteous physician, who also exerts a fatherly oversight over all the activities of the clinic.

Professor Bokay is much interested in the history of pediatrics, and zealously guards in his library the first book on pediatrics by Mercurialis, published in Latin in 1601. From this clinic appeared the first report on 1,000 cases of diphtheria in which intubation was practiced with the O'Dwyer tubes. In the pathologic museum are many exquisite specimens showing unusual varieties of involvement with diphtheric membrane. The war has not embittered the spirit of Professor Bokay. He still directs his visitors to his gallery where are displayed the pictures of his colleagues of many lands engaged on both sides of the recent conflict.

The present child health program in Hungary is in some respects the most complete in the world. Much of its success is due to the unfailing and whole-hearted support of this kindly wise teacher, who has the confidence and affection of all classes in the country.

JUGOSLAVIA

Inquiry was made at Belgrade concerning the teaching of pediatrics. The medical school there was opened only three years ago. There will be no course in pediatrics for another year. As yet there is no professor appointed.

The impression made on us from our hurried inspection of the more important pediatric clinics in eastern Europe was that, in the main, excellent didactic instruction is given—instruction that would compare favorably with that elsewhere in the countries of western Europe. One can be confident that each of these new republics in old lands, in the future, will have excellent pediatricians who will make valuable contributions to our field of work and who will have an intelligent interest in infant and child hygiene.

A large part of the practical experience of these future children's men in the actual handling of patients will have to be obtained after graduation.

Need for Local Health Officer.—Compliance with the law is a duty which is imposed upon us all, no matter what profession we follow, whether we be preachers of the gospel, lawyers or physicians. Because of the importance of health, there are a great many laws pertaining to it, and the physician is at times put to it pretty hard to comply to the letter. There should be a local health officer to aid him in every way possible.—Chichester, P. M.: *Virginia M. Monthly* **50**: 466 (Oct.) 1923.

Medicolegal

Valid Arrangement for Care of Tuberculous Patients

(City and County of San Francisco et al. v. Boyle, Auditor (Calif.) 215 Pac. R. 549)

The Supreme Court of California says that this was an application for a writ of mandate to compel the auditor of the city and county of San Francisco to audit and approve a demand in favor of the county of Alameda for $5,000 on account of expenses incurred by the latter county for architect's fees, plans and specifications for proposed units to be added to the hospital maintained by the latter county, near Livermore, for patients with tuberculosis, such units being intended for the benefit of the city and county of San Francisco in the care and treatment of patients thereof affected with tuberculosis. The auditor contended that the arrangement made was invalid; and this proceeding was designed to test its validity.

To make provision for the care of indigent sick and dependent poor is a duty of state and society. A duty equally great rests on the state to protect and guard the health of the public from infectious or other communicable forms of diseases, one of the most widely prevalent of which is tuberculosis. The board of supervisors of the city and county of San Francisco, in dealing with the question, found as a fact that the zone in which it proposed to maintain and care for its patients affected with tuberculosis possesses a more favorable climatic condition and superior surroundings for the successful treatment of the disease than is possessed by that city and county. Without such a finding of fact, which is conclusive on this court, the court would be permitted to take judicial notice of the geographic position of the two localities with reference to proximity to the sea and the influence of ocean winds on the climate of each, and also the density of the population of each considered relatively in respect to areas. In the treatment of pulmonary forms of tuberculosis, the main reliance for improvement or cure rests largely on the accessibility of the patient to pure, fresh air such as altitude and open areas afford. Rest and quiet are other essentials. From recitals found in the agreement, the board of supervisors was unquestionably induced or influenced to enter into the contract by a proper consideration for the comfort and welfare of the affected patients, as well as the discharge of a duty which was cast on it to protect the health of the public.

The authority under which the city and county justified its right to make the contract was the statute effective July 29, 1921, an act providing for the joint exercise of powers by counties, by municipalities, or by municipalities and counties; and this court knows of no reason why the city and county should be prevented from bringing itself within the provisions of that statute. The statute and the one effective Aug. 2, 1921, each authorizes the adoption of a plan and procedure independent of the other, and neither one was intended to be exclusive. Whether the plan adopted could be improved on was not a question for this court's determination. Any method or system devised would be subject to criticism. But, however that might be, the court is unable to see any legal objection to the plan proposed.

Nor was it made clear that the proposed plan should be declared invalid for the reason that the county of Alameda was to retain supervisory control of the hospital. Any institution designed for the treatment of persons affected with tuberculosis must from necessity be under the direction and management of skilled, efficient persons. There doubtless exist good reasons for protecting persons who are suffering in the incipient stage from those who are suffering in the more advanced stages, thus requiring rules of classification according to the stages of the disease. There may also be good reasons for the rejection or removal of patients whose reception or retention would endanger the welfare of others. Reasonable rules and regulations are highly essential to the successful management of a sanatorium. It could not be presumed that unreasonable rules would be adopted, or that arbitrary authority would be exercised in any respect. The agreement in this case provided that all rules to govern the institution should operate uniformly on the patients of both parties to the contract. It was to be expected that a sanatorium or hospital maintained for the care and treatment of persons affected with tuberculosis would require a different kind of skill in administering treatment, in superintendence and in management, than would be required by a county institution for the care of persons suffering from ordinary ailments.

The writ of mandate sought is granted.

Detention of Woman Refusing to Be Examined for Venereal Disease

(Ex parte Clemente (Calif.), 215 Pac. R. 698)

The District Court of Appeal of California, Second District, Division 1, says that the petitioner was before the court on a writ of habeas corpus. The petition therefor set forth that she was illegally detained and restrained of her liberty by the chief of police of the city of Los Angeles, acting under instructions from the health department of that city not to release her until she submitted to an examination ordered to be made by the health department for the purpose of determining whether she was affected with a contagious or infectious disease. On the hearing the testimony showed that the petitioner had been arrested and charged with conducting a house of ill fame. Two police officers of the city testified that they visited the house of the petitioner on the day of her arrest, and of the acts and conduct of the petitioner on that occasion. There was also testimony to the effect that the reputation of the petitioner's house was that of a house of ill fame. This information had all been furnished to the health department, and on it the department made its order for the examination of the petitioner and for her detention until she should submit to such an examination. Repeated demands had been made of the petitioner by the health department that she submit to the required examination, all of which had been refused by her. The court is satisfied that the testimony produced at the hearing warranted the conclusion that the house conducted by the petitioner was a house of ill fame, that she was an inmate thereof, and personally participated in the unlawful acts carried on therein. The health department having this information was, in the court's opinion, justified in its detention of the petitioner. This information furnished reasonable ground to believe that the petitioner was affected with the kind of disease referred to, and this was all that was necessary to authorize the health department to enforce quarantine measures against her. Wherefore she was remanded to the custody of the chief of police.

Society Proceedings

COMING MEETINGS

American Pathological Society, St. Louis, Dec. 27-29. Dr. Wade H. Brown, Rockefeller Institute for Medical Research, New York, Sec'y.

American Physiological Society, St. Louis, Dec. 27-29. Dr. Charles W. Greene, University of Missouri, Columbia, Mo., Secretary.

American Society of Biological Chemistry, St. Louis, Dec. 27-29. Dr. Victor C. Myers, New York Post-Graduate Medical School, New York, Secretary.

Association for Research in Nervous and Mental Diseases, New York, Dec. 27-28. Dr. Sanger Brown, 2d, 173 E. 70th St., New York, Sec'y.

District of Columbia, Medical Society of, Washington, Jan. 2. Dr. C. B. Conklin, Medical Science Bldg., Washington, Secretary.

Isthmian Canal Zone, Medical Association of, Ancon, Dec. 21. Dr. J. J. Moore, Ancon Hospital, Ancon, Secretary.

Porto Rico, Medical Association of, San Juan, Dec. 14-16. Dr. Augustin R. Laugier, Box 1117, San Juan, Secretary.

Radiological Society of North America, Rochester, Minn., Dec. 3-7. Dr. M. J. Sandborn, Appleton, Wis., Secretary.

Society of American Bacteriologists, New Haven, Conn., Dec. 27-29. Dr. J. M. Sherman, Box 184, Washington, D. C., Secretary.

Southern Surgical Association, White Sulphur Springs, W. Va., Dec. 11-13. Dr. H. A. Royster, 423 Fayetteville Street, Raleigh, N. C., Secretary.

Western Surgical Association, Colorado Springs, Colo., Dec. 6-8. Dr. Warren A. Dennis, Hamm Bldg., St. Paul, Minn., Secretary.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Physiology, Baltimore

66: 1-213 (Sept.) 1923

*Influence of Diet on Alkaline Reserve and Insulin in Hypoglycemia in Rabbits. I. H. Page, Indianapolis.—p. 1.
*Chemical Regulation of Respiration. I. Metabolism of Respiratory Center and Coordination of Dual Function of Hemoglobin. R. Gesell, St. Louis.—p. 5.
Sensitization to Heat Due to Exposure of Short Wave Lengths. Influence of Ozone. H. S. Forbes and G. A. Daland, Boston.—p. 50.
Sensitization of Protoplasm to Heat by Exposure to Light of Short Wave Length. W. T. Bovie and G. A. Daland, Boston.—p. 55.
*Physiology of Sleep. I. Effects of Prolonged Sleeplessness on Man. N. Kleitman, Chicago.—p. 67.
*Calorigenic Action of Epinephrin Chlorid. W. M. Boothby and I. Sandiford, Rochester, Minn.—p. 93.
Phase Reversal in Emulsions and Protoplasm. W. Seifriz, New Haven, Conn.—p. 124.
Effect of Gastrin and Histamin on Movements of Stomach and Intestine During Hunger. A. C. Ivy and D. A. Vloedman, Chicago.—p. 140.
Seasonal Changes in Gases and Sugar of Blood and Nitrogen Distribution in Blood and Urine of Alligator. A. Hopping, New York.—p. 145.
Physiology of Vitamins. II. Parenteral Administration of Vitamin B. Mammalian Experiments. G. R. Cowgill, New Haven, Conn.—p. 164.
Effect of Fatigued Muscle on Perfused Epinephrin. R. G. Hoskins and E. P. Durrant, Columbus, Ohio.—p. 176.
*Locomotion of Leukocytes. I. Normal Rate of Locomotion of Human Neutrophilic Leukocytes in Vitro. M. McCutcheon, Philadelphia.—p. 180.
*Id. II. Effect of Temperature on Rate of Locomotion of Human Neutrophilic Leukocytes in Vitro. M. McCutcheon, Philadelphia.—p. 185.
Some Effects of Various Environmental Temperatures on Blood of Dogs. F. B. Flinn and E. L. Scott, New York.—p. 191.
Absorption from Cloaca in Birds. N. C. Sharpe, Toronto.—p. 209.

Influence of Diet on Alkaline Reserve and Insulin Hyperglycemia.—Page's work shows that acid ash forming diets produce a condition of mild acidosis in rabbits whereas basic ash diets tend toward the production of alkalosis. Acid diets render rabbits more resistant to the hypoglycemic effects of insulin than basic diets by tending to produce a condition of acidosis, thus increasing glycogenolysis and in this way antagonizing the insulin action. Diet in the rabbit is an important factor in the regulation of the blood sugar level.

Chemical Regulation of Respiration.—The following points are emphasized by Gesell. Changes in acidity of the respiratory center constitute the primary chemical control of respiration. Changes in oxidation constitute a less direct control. But as oxidation determines the kind and amount of acid formed and the efficiency of transport and elimination, it is, in the end, the normal regulator of respiration. In accordance with this view two kinds of acid make up the normal respiratory stimulus, (1) a poorly diffusible and fixed acid, such as lactic acid, and (2) the weak, volatile and readily diffusible carbon dioxid, the respiratory stimulus being the sum of the effects of both. During anoxemia reduced oxidation in the center leads to an increased formation of acid and to an accumulation of the relatively poorly diffusible acid in a relatively poorly buffered cytoplasm no longer fully protected by the potential alkalinity of the blood or by its own buffer salts. By virtue of its own acid metabolism and its extreme sensitivity to minute changes in its own p_H, the center is sensitive to minute changes in the oxygen tension of the arterial blood and is in a position to act as vanguard to internal respiration. The capacity of the center to act as rearguard, however, must not be overlooked. Since fluctuations in the general level of carbon dioxid and oxygen in the blood is a function of the fluctuations in the general metabolism as well as of pulmonary ventilation, the respiratory center must of necessity continually function both as vanguard and rearguard to internal respiration.

Effects of Experimental Insomnia.—Kleitman studied the effects of experimental insomnia in man, the duration of complete sleeplessness being from forty to 115 hours. Subjectively, the persons employed could easily keep awake while engaged in some sort of activity, but felt very drowsy when sitting, and fell asleep immediately on lying down. Muscular relaxation induces sleep under normal conditions (confirming Coriat), but practically precipitates sleep under conditions of experimental insomnia. Blood sugar, alkaline reserve of the blood and plasma, percentage of hemoglobin, percentage of corpuscles, red and white blood cell count, body weight, basal metabolic rate, appetite, temperature, ability to name letters and to do mental arithmetic, all of these showed no variations from normal during the period of sleeplessness. Respiration, heart rate, blood pressure, showed a marked decrease in insomnia, but this decrease was due mainly to greater muscular relaxation of the sleepy subject. Numerous reflexes were found to be present in sleep following insomnia, but the response was somewhat sluggish. Sleep seemed to be deeper six hours after its onset than at the end of two hours. A positive Babinski reflex could be elicited in every subject tested during the sleep that followed insomnia. It is interpreted as indicating a functional block of the pyramidal system of fibers. This reflex could be reversed by rapidly repeated stimulation of the sole. The depth of the sleep decreased at the same time. This indicates that a number of subminimal stimuli overcome the synaptic resistance and produce a flexion of the great toe. The onset of sleep is probably due to complete muscular relaxation, voluntary or involuntary. A provisional theory is proposed, based on the conception of "levels" in the central nervous system, as first elaborated by Hughlings Jackson. Sleep may be due to fatigue of the highest centers of consciousness, and dreaming to the persistence of the activity of the lower centers.

Calorigenic Action of Epinephrin Chlorid.—Evidence is presented by Boothby and Sandiford that epinephrin when injected intravenously into dogs in doses that seem probably within the power of the suprarenals to secrete, does actually increase the rate of heat production, probably producing this increase by a general and quite parallel increase in the heat production of all or nearly all types of cells. The increased metabolism is accompanied by an elevation of the respiratory quotient, and by a slight increase in the blood sugar concentration, as well as certain other secondary manifestations.

Velocity of Locomotion of Leukocytes.—A method is given by McCutcheon for determining the velocity of normal human neutrophilic leukocytes examined in whole blood in vitro. In the case of the individual chosen the average rate of locomotion, under the conditions described, was 170.6 ± 2.2 microns in five minutes, or 34.1 microns per minute, at 37 C.

Effect of Temperature on Locomotion of Leukocytes.—McCutcheon found the velocity of locomotion shown by neutrophilic polymorphonuclear leukocytes of one person to be doubled by a rise in temperature of 10 C. within certain limits of temperature variation. This constitutes another instance in which van't Hoff's law is found to hold for biologic phenomena.

American Journal of Tropical Medicine, Baltimore

3: 369-460 (Sept.) 1923

Culion Leper Colony. H. W. Wade and J. A. Basa, Culion, Palawan, P. I.—p. 395.
*Bacteriology of Leprosy. II. Chromogenic Acid-Fast Bacillus of Clegg. E. L. Walker.—p. 417.
Acute Form of American Trypanosomiasis: Pathology, Necropsy, Trypanosomiasis Cruzi in Animals. B. C. Crowell, Philadelphia.—p. 425.

Growing Clegg Leprosy Bacillus.—The cultivation of a chromogenic acid-fast bacillus from leprous lesions on Musgrave and Clegg's medium is confirmed by Walker. Neither the symbiotic amebas of Clegg nor the protein split products of Duval are necessary for the growth of this organism. The essential factor for the development of Clegg's bacillus appears to be the lean medium containing only traces of nutrient substances. Clegg's acid-fast bacillus develops in transplants from colonies of Bordoni-Uffreduzzi's partially acid-fast diphtheroid on Musgrave and Clegg's medium. A chromogenic acid-fast bacillus, similar to Clegg's bacillus, develops in transplants from colonies of the pleomorphic diphtheroid from preputial smegma on Musgrave and Clegg's medium. A nonchromogenic acid-fast bacillus, with morphologic differences from Clegg's bacillus, develops in cultures from nonleprous nasal secretions and from Hoffmann's diph-

theroid isolated from such secretions on Musgrave and Clegg's medium. Clegg's bacillus appears to be a developmental stage of Bordoni-Uffreduzzi's diphtheroid, but the possibility that it may be a contamination cannot as yet be excluded absolutely. Both Clegg and Bordoni-Uffreduzzi and their successors may have cultivated different forms of one and the same pleomorphic bacterium from leprosy. This organism appears to be identical with or closely related to the pleomorphic and facultative acid-fast *Bacillus smegmatis.*

Annals of Clinical Medicine, Baltimore

2: 75-135 (Sept.) 1923

Newer Conception of Asthma and Hay-Fever. R. A. Kern, Philadelphia.—p. 75.
Modern Treatment for Asthma. J. A. Clarke, Philadelphia.—p. 83.
Treatment of Acute Pneumococcus Pneumonias. S. S. Cohen, Philadelphia.—p. 90.
*Results with Kidney Function Tests. L. M. Breed and J. Rendall, Pasadena, Calif.—p. 105.
*Present Status of Quinidin Therapy. C. C. Wolferth, Philadelphia.—p. 123.
*Basal Metabolic Rate Determination. W. H. Stoner, Philadelphia.—p. 131.

Results with Kidney Function Tests.—The results of a series of tests of the functional power of the kidney in 250 suspected cases of nephritis are presented by Breed and Rendall. They assert that for a proper estimation of the efficiency of the kidney, none of the so-called renal function tests is reliable. The most reliable results are secured from the blood chemistry and the two hourly and day and night variations in specific gravity at the end of three days of high protein, salt and liquid intake. The authors' experience has shown that high values for uric acid and sugar in the blood under such conditions are suggestive of cholecystitis. Twenty such cases were subjected to operation and all showed varying degrees of cholecystitis or cholelithiasis. Forty other such cases gave clinical evidence of cholecystitis. The operated cases all showed a lowering of uric acid and sugar in the blood after operation. A diet is outlined which has been found beneficial in cases of cholecystitis, either postoperative or without operation.

Status of Quinidin Therapy.—The results of quinidin therapy, in Wolferth's opinion, are excellent in cases of auricular fibrillation of short duration and good compensation. It is of little value in fibrillation of long standing and is contraindicated in the presence of advanced heart failure. Digitalis, rather than quinidin, should be the first remedy employed in auricular flutter. Quinidin has shown promise of being valuable in the treatment of suitable cases of paroxysmal rapid heart action. It has no value in the treatment of simple tachycardia and a very limited field of usefulness in extrasystolic arrhythmia. Quinidin in appropriate dosage has been shown experimentally to depress the principal functions of heart muscle, including contractility, conductivity, stimulus production and excitability. It also prolongs the refractory period of heart muscle and causes weakness of vagus nerve action.

Basal Metabolic Rate Determination.—Basal metabolic rate is defined by Stoner. The various standards and methods of determinations are outlined. The necessity for rigid standardization of the preparation of the subject is emphasized. A simple formula for calculating the basal metabolic rate from the four minute oxygen consumption is given. Brief general reference is made to the important literature.

Annals of Surgery, Philadelphia

78: 305-432 (Sept.) 1923

*End Results of Arterial Transplants. O. Klotz, Sao Paulo, Brazil. H. H. Permar and C. C. Guthrie, Pittsburgh.—p. 305.
Relation of Surgery to Vascular Sympathetic System. W. A. Sherwood, Brooklyn.—p. 321.
Anthrax and Its Treatment. H. E. Santee, New York.—p. 326.
*Operative Curability of Carcinoma of Stomach. D. Cheever, Boston.—p. 332.
Ten Cases of Acute Perforation of Duodenal Ulcer. H. K. Shawan and C. F. Vale, Detroit.—p. 342.
Acute Intussusception in Infants. Fifty-One Cases. R. W. Bolling, New York.—p. 349.
*Experimental Study on Use of Intra-Abdominal Injections of Hypertonic Glucose Solution in Treatment of Peritonitis. J. K. Narat, Chicago.—p. 357.
Influence of Hemorrhage on Mortality in Gunshot Wounds and Other Injuries of Abdomen. J. M. Mason, Birmingham, Ala.—p. 364.
*End Results in Malignant Disease of Testis. W. B. Coley, New York.—p. 370.
*Empyema of Ureteral Stump Following Incomplete Ureterectomy. A. Hyman, New York.—p. 387.
Rupture of Tendon of Extensor Longus Pollicis Following a Colles Fracture. A. P. C. Ashhurst, Philadelphia.—p. 398.

Arterial Transplantation.—An analysis of the end results in two cases of transplantation of vascular segments is given by Klotz, Permar and Guthrie. They illustrate the similarity of the functional results regardless of whether living heterologous tissue is used in transplantation of whether devitalized vascular segments are used. In one case a rabbit aorta was transplanted on the carotid artery of a dog. In the second case the devitalized (liquor formaldehydi fixed) segment of dog vena cava was transplanted on the common carotid artery of a dog. It served to preserve the circulation of the common carotid artery for a period of eleven years when death resulted from a tumor of bone. The implanted segment, which at the time of the original experiment had been devitalized, persisted in parts of its structure, there still being remnants of collagen and elastic fibers of the original implant. The original dead elements of the segment were not entirely removed. The introduced segment and its secondary walls were uniformly dilated to give rise to a fuseiform dilatation. The segment was also lengthened. The authors call attention to the fact that in all instances in which a dead segment serves its purpose for more than a month or six weeks an aneurysmal dilatation occupies its length. This fusiform sacculation persists not only during the existence of the segment, but permanently with the reestablishment of the new tube. The presence of such a fusiform dilatation may predispose to the development of a thrombus at a time long after the effects of the operative intervention have disappeared, as is the case with true aneurysms. The development of saccular dilatation in these living heterologous or dead segments further substantiates the evidence that the most important lesion which leads to dilatation is a loss of the strength of the media.

Operative Curability of Carcinoma of Stomach.—The records of 250 cases of carcinoma of the stomach were reviewed by Cheever. Two thirds of the number occurred in men. Weakness and debility, general abdominal pain, loss of weight, constipation, pallor and backache together constituted the initial symptoms in 20.8 per cent. of the cases. In 30 per cent., the earlier symptoms would not be likely to suggest to the patient that the stomach was the source. Vomiting before admission occurred in 68 per cent. Blood or coffee grounds were noted in forty-eight cases. Tarry stools were noted in twenty-six cases. In the great majority of these 236 patients the disease was too advanced to permit radical operation. Fifty per cent. had had symptoms for only six months, and 80 per cent. for less than one year. An ulcer history was positive in 7.6 per cent.; plausible in 5.9 per cent.; possible in 8.4 per cent.; and absent in 77.9 per cent. Radical operation was performed in twenty-three cases. Of patients not operated on 20.6 per cent. lived four months or more, while 73.3 per cent. of the patients afforded palliative operations lived a similar period. Thirteen per cent. of the patients radically operated on were living at the end of five years without evidence of recurrence. Another patient was living at the end of four years and eleven months. Another lived seven years, but developed an apparently independent cancer of the breast and died of spinal metastases without known local recurrence of the carcinoma of the stomach.

Intra-Abdominal Injection of Hypertonic Glucose Solution in Peritonitis.—In order to make the treatment of free peritonitis as physiologic as possible, that is to stimulate the natural function of the peritoneum, Narat experimented successfully in rabbits with intra-abdominal injections of hypertonic glucose (20 per cent.) solution. Since this method is absolutely harmless and gives encouraging results, Narat feels justified in suggesting that this treatment be used in human beings in suitable cases. About 500 c.c. of 20 per cent. glucose solution would be the proper initial dose. The injections could be repeated through the drainage tube every six or twelve hours. Certain fundamental principles laid down for

the treatment of peritoneal inflammation must be observed strictly, namely, gastric lavage, Fowler's posture, absolutely nothing to be put into the stomach, rectal feeding, introduction of liquids into the system by proctoclysis, hypodermoclysis or intravenous infusions, avoidance of purgation, etc. In addition, at the end of the operation, if such is indicated, the glucose solution may be poured into the abdominal cavity and the injection repeated through the drainage tube periodically.

Permanent Cure Following Removal of Malignant Tumor of Testis.—The number of permanent cures following surgical removal of the testis for malignant disease, Coley says, is comparatively small, the proportion being not over 5 or 10 per cent. This number, in his opinion, is not sufficiently increased by the radical removal of the retroperitoneal glands by the abdominal route to warrant the risk of such an operation. Long continued systemic treatment with the mixed toxins of erysipelas and *Bacillus prodigiosus*, combined with thorough irradiation of the abdomen and supraclavicular glands by radium or roentgen rays, he assures, offers a far better hope of permanent cure than any form of operative treatment alone.

Empyema of Ureteral Stump.—The three cases reported by Hyman demonstrate that the ureteral stump left behind after an incomplete ureterectomy may be the cause of a persistent pyuria. Two of the cases operated on also revealed how difficult a surgical procedure it is to excise this stump, and emphasizes the necessity, when doing a primary ureterectomy for pyoureter, for excising the entire ureter down to its entrance into the bladder.

Archives of Occupational Therapy, Baltimore

2: 335-414 (Oct.) 1923

*Health and Industrial Problems of Heart Disease in Middle Life. F. Brush, White Plains, N. Y.—p. 335.
Psychology of Occupational Therapy. E. L. Canton, Washington, D. C.—p. 347.
Occupational Therapy and Vocational Training in Tuberculosis Sanatorium. A. T. Laird, Nopeming, Minn.—p. 359.
Therapeutic Value of Toy Making. C. B. Davis, Washington, D. C.—p. 369.
Working Program for Section on Occupational Therapy and Employment of Tuberculosus Patients of the Masaryk League Against Tuberculosis. H. J. Pelc, Prague, Czechoslovakia.—p. 377.
Occupational Therapy in Canada. J. H. Stewart, Winnipeg.—p. 381.
Occupational Therapy in Virginia. V. G. Cole, Marion, Va.—p. 385.
Occupational Therapy in Vermont. C. Williams, Woodstock, Vt.—p. 389.
Occupational Therapy in Mississippi. E. G. Morse, Jackson, Miss.—p. 397.
Occupational Therapy at North Dakota State Hospital. A. W. Guest, Jamestown, N. D.—p. 399.

Industrial Problems of Heart Disease.—The prevention of overstress in patients of working age with cardiac disease, Brush says, is really a form of heart disease prevention, for each recurrence is a new disease complex. A nationalized heart association is needed to exert influence on many of the broader and social questions involved.

Arkansas Medical Society Journal, Little Rock

20: 85-98 (Oct.) 1923

Chronic Hyperchlorhydria; Bedside Diagnosis and Treatment. E. L. Miller, Crossett.—p. 85.
Auto Camping Trip as Vacation for the Doctor and His Family. T. Cothern, Jonesboro.—p. 88.

Atlantic Medical Journal, Harrisburg, Pa.

27: 1-54 (Oct.) 1923

Medical Care of Rural Population. H. C. Frontz, Huntingdon, Pa.—p. 1.
Experience with Insulin in Treatment of Diabetes Mellitus. J. A. Lichty, Pittsburg.—p. 5.
Cancer Problem. H. L. Foss, Danville, Pa.—p. 11.
*Carcinoma of Breast. J. S. Rodman, Philadelphia.—p. 13.
Mental Medicine of Yesterday, Today and Tomorrow. H. Victor, Danville, Pa.—p. 16.
Cavernous Sinus Thrombosis. W. S. Reese, Philadelphia.—p. 19.
Aids in Diagnosis of Skin Diseases. S. S. Greenbaum, Philadelphia.—p. 21.
Simplification of Serologic Diagnosis of Syphilis. R. A. Kilduffe, Los Angeles.—p. 23.
Treatment of Appendiceal Peritonitis. E. P. Buchanan, Pittsburgh.—p. 25.
Diagnosis and Treatment of Diseases of Rectum. F. G. Runyeon, Reading, Pa.—p. 27.
Prenatal Care in Philadelphia. P. F. Williams, Philadelphia.—p. 29.

Carcinoma of Breast.—Rodman emphasizes points that every one should keep in mind: cancer of the breast is a curable disease if radical treatment can be instituted sufficiently early. There are definite "precancerous" conditions of the breast of which chronic mastitis and papillary cystadenoma are the most important. Fifty per cent. of the cases of definite carcinoma can be cured by proper radical treatment, but not over 30 per cent. can be cured when the clinical diagnosis can be made with certainty.

Boston Medical and Surgical Journal

189: 485-530 (Oct. 11) 1923

Case of Marked Hypertension in Boy of Fourteen Associated with Congenital Hydronephrosis and Nephritis. W. C. Quinby, Boston.—p. 485.
Case of Cancer of Prostate Relieved by Radium. R. Graves, Boston.—p. 486.
Urologic Aspects of Hemophilia. J. D. Barney, Boston.—p. 486.
Early Hydronephrosis Associated with Aberrant Arteries. E. G. Crabtree, Boston.—p. 505.
Four Cases of Favus in One Family. J. H. Swartz, Boston.—p. 507.
Work of School Physician. D. S. Luce, Canton, Mass.—p. 510.
Milk and Public Health. J. Garland, Boston.—p. 513.

189: 531-580 (Oct. 18) 1923

*Infectious (Catarrhal) Jaundice. C. M. Jones and G. R. Minot, Boston.—p. 531.
*Alcohol Check Experiments with Portable Respiration Apparatus. T. M. Carpenter and E. L. Fox, Boston.—p. 551.
Fallacy of Using Alcohol for Sterilization of Surgical Instruments. R. N. Nye and T. R. Mallory, Boston.—p. 561.
Milk and Public Health. J. Garland, Boston.—p. 563.

Infectious Jaundice.—Twenty-six cases of infectious jaundice have been studied critically by Jones and Minot. Additional observations have been made on a number of other cases. The studies indicate that the jaundice may be separated into two rather distinct phases. Early in the disease there is usually an obstructive phase in which the duodenal contents contain little or no bile. The second phase is marked by an abnormally large output of bile pigment into the intestine. Rapid clinical improvement, with decrease of the jaundice, approximately coincides with the period of greatest elimination of bile pigments into the duodenum. Jaundice of the skin and sclerae may last for months, but disappears days or weeks before the bile pigments reach their normal level in the blood and duodenal contents.

Alcohol Check Experiments with Portable Respiration Apparatus.—Carpenter and Fox recommend that with the Benedict and Collins portable respiration apparatus the correction for change in temperature of the bell be made on the whole contraction as a rise of 1.8 mm. per degree centigrade; and that Wilson soda lime be employed as the absorbent for carbon dioxid and the assumption be made, in calculating the results, that the air in the spirometer bell is completely saturated. Users of the Roth modification of the Benedict and Collins portable apparatus should calculate their results on the basis that the air is dry when the ordinary soda lime is used and employ Roth's correction of minus 2 per cent. when Wilson soda lime is the reagent for absorbing the carbon dioxid; and that the correction for temperature be made on the whole contraction as directed by Roth, namely, 0.5 mm. per degree centigrade. Whether the ordinary soda lime or the Wilson soda lime is used with the student apparatus of Benedict and Benedict, the calculations should be made on the basis that the gas is in a dry condition.

California State Journal of Medicine, San Francisco

21: 409-454 (Oct.) 1923

Otitis Media in Infants and Children. C. D. Sweet, Oakland.—p. 409.
Local Anesthesia in Major Surgery. L. Eloesser, San Francisco.—p. 412.
Therapeutic Aspect of Short Wave Roentgen Rays. A. Soiland, Los Angeles.—p. 415.
Heart Failure. W. J. Kerr, San Francisco.—p. 417.
Essential Points in Treatment of Diabetes with Insulin. W. D. Sansum and N. R. Blatherwick, Santa Barbara.—p. 420.
Etiology of Gastric and Duodenal Ulcers. G. E. Ebright, San Francisco.—p. 423.
Analysis of Four Thousand Cases of Gonorrhea Treated in Public Clinic. A. R. Rogers, Los Angeles.—p. 425.
*Roentgen-Ray Treatment of Whooping Cough. J. J. Kingston and H. K. Faber, San Francisco.—p. 429.
Fatal Air Embolism After Puncture of Maxillary Antrum. J. A. Bacher, Stanford.—p. 433.

Roentgenotherapy of Whooping Cough.—Of twenty-four pertussis patients subjected to roentgen-ray treatment by

Kingston and Faber, four showed remarkable improvement after the initial treatment, while two were not relieved even after three exposures. Ten of the remainder were markedly better after two treatments, the vomiting and, in most instances, the typical paroxysms stopping. The other eight showed a more gradual improvement but were not considered cured after the last treatment. The most constant effect of the roentgen ray was the prompt cessation of vomiting, which occurred even in those cases in which the whoop did not abate.

Canadian Medical Association Journal, Montreal

13: 703-780 (Oct.) 1923

What of Future Surgery? D. Cheever, Boston.—p. 703.
Vertigo and Its Significance in General Medicine. R. S. Pentecost, Toronto.—p. 708.
Effect of Ether Anesthesia on Afferent Paths in Decerebrate Animals. A. Forbes and R. H. Miller, Boston.—p. 715.
Anesthesia and Analgesia in Labor. R. Mitchell, Winnipeg.—p. 718.
Diagnosis of Diseases of Stomach and Duodenum. H. A. Bruce, England.—p. 724.
Serous Meningitis of Otitic Origin. E. H. White, Montreal.—p. 730.
School Health Supervision in Rural and Urban Centers. J. T. Phair, Toronto.—p. 733.
Chronic Myocardial Disease. J. A. Macgregor, London.—p. 738.
*Origin of Ammonia in Urine. I. M. Rabinowitch, Montreal.—p. 742.
Idiopathic Menorrhagia and Roentgen-Ray Therapy. E. L. Stewart and H. M. Tovell, Toronto.—p. 745.
Diagnosis of Pulmonary Tuberculosis. A. H. W. Caulfield, Toronto.—p. 749.

Origin of Ammonia in Urine.—Data have been obtained clinically by Rabinowitch which support the view recently put forward that one function of the kidney is to form ammonia.

Colorado Medicine, Denver

20: 255-302 (Oct.) 1923

London Meeting of International Surgical Association. L. Freeman, Denver.—p. 260.
Treatment of Syphilis of Central Nervous System. A. L. Skoog, Kansas City.—p. 266.
Diagnosis in Right Sided Abdominal Pain. J. M. Mayhew and A. L. Smith, Lincoln, Neb.—p. 275.

Indiana State Medical Association Journal, Ft. Wayne

16: 325-358 (Oct.) 1923

Our Medical Profession and Its Achievements. C. H. Good, Huntington.—p. 325.
Surgery and Surgery Technic. F. T. Romberger, Lafayette.—p. 329.
Radical Cure of Cystocele. C. M. Mix, Muncie.—p. 333.
Physiotherapy. W. W. Carey, Ft. Wayne.—p. 335.

Journal of Industrial Hygiene, Boston

5: 189-244 (Oct.) 1923

Placing Cardiac Patients in Regular Industries. J. S. Sheppard.—p. 189.
Weber's Law, Tolerance and Visual Judgment of Size in Bottle Making Industry. J. P. Baumberger and E. E. Perry, Stanford University, Calif.—p. 205.
Medical Features of Factory Inspection. Review of Literature on Industrial Hygiene and Industrial Disease in Germany in 1922. L. Teleky, Düsseldorf.—p. 210.
*Dusted Lung. Inhalation of Silica Dust; Relation to Pulmonary Tuberculosis. B. S. Nicholson.—p. 220.

Effect on Lung of Inhalation of Dust.—Nicholson's review brings out these facts: All dusts are not equally harmful—e. g., coal is especially beneficial, lime is neutral, but silica is particularly injurious. Silica, owing to the formation of pulmonary fibrosis, causes a train of symptoms which can be distinguished clinically from those of pulmonary tuberculosis. For this purpose radiography is of great use. The evidence of the injurious character of silica dust is drawn chiefly from industrial mortality statistics in which all forms of phthisis are taken together. Statistical evidence from all parts of the world agrees on this point; and there is no evidence that any other factor beyond the inhalation of silica is the responsible agent. Careful consideration of the disease entity, pulmonary silicosis, of its slow development and clinical manifestations, and of its noninfective character, point to the conclusion that more persons than is generally thought die without becoming tuberculous. The low infectivity of cases of pulmonary fibrosis is probably due (*a*) to the fact that many cases are never tuberculous at all, and (*b*) to the rapid termination of open infective cases, leaving but a short period for infecting contacts. Nicholson feels that the terminology appearing today on death certificates is faulty; the cases should be described as (*a*) pulmonary fibrosis, and (*b*) tuberculosis (if present). The term "phthisis" is unsatisfactory and should be expunged.

Kansas Medical Society Journal, Topeka

23: 269-302 (Oct.) 1923

Arterial Hypertension. L. S. Milne, Kansas City.—p. 269.
Anemias. J. L. Lattimore, Topeka.—p. 272.
Symptomatology and Diagnosis of Acute Poliomyelitis. C. F. Menninger, Topeka.—p. 274.
Treatment of Poliomyelitis. K. A. Menninger, Topeka.—p. 278.

New Jersey Medical Society Journal, Orange

20: 325-376 (Oct.) 1923

Diagnosis of Pulmonary Tuberculosis. M. W. Newcomb, Brown's Mills, N. J.—p. 325.

New Orleans Medical and Surgical Journal

76: 169-214 (Oct.) 1923

Diagnosis and Treatment of Tumors of Spinal Cord, Involving Conus and Cauda Equina. W. O. Ott and A. W. Adson, Rochester, Minn.—p. 169.
*Renal Lesions Due to Ureteral Obstructions Other Than Calculus. H. W. E. Walther, New Orleans.—p. 172.
Preeclamptic Toxemia. E. L. King and A. H. Gladden, Jr., New Orleans.—p. 175.
*Duodenal Dilatation. Report of Cases. A. Levin, New Orleans.—p. 178.
Observations from Service of Newly-Born at Touro Infirmary. L. R. DeBuys, New Orleans.—p. 184.
Charity Hospital of Louisiana. A. E. Fossier.—p. 188.
Digitalis in Heart Failure. J. B. Guthrie, New Orleans.—p. 196.

Kidney Lesions Due to Noncalculous Obstruction.—On the basis that too many kidneys are being sacrificed needlessly, Walther suggests that, unless expediency demands it, nephrotomy be done reserving nephrectomy for the second stage operation when simple drainage fails.

Duodenal Dilatation.—In Levin's opinion, duodenal dilatation is often responsible for the symptoms of so-called vicious circle after gastro-enterostomy and other conditions, such as reversed peristalsis. In his opinion, reversed duodenal peristalsis is the primary cause of so-called "heartburn."

New York State Journal of Medicine

23: 397-434 (Oct.) 1923

Studies in Use of Insulin. J. J. R. Macleod, Toronto.—p. 397.
Treatment of Diabetes With and Without Insulin. E. P. Joslin, Boston.—p. 399.
Insulin Treatment of Diabetes Mellitus. J. R. Williams, Rochester, N. Y.—p. 402.
*Relative Immunity of Infants Under Five Months of Age to Infection with Measles. C. Herrman, New York.—p. 404.
*Congenital Diaphragmatic Hernia of Right Side; Its Diagnosis in Life. P. M. Stimson, New York.—p. 408.
Common Drug Eruptions. J. J. Eller, New York.—p. 415.
Periodic Examination of Well Children. R. M. Smith, Boston.—p. 419.
Occurrence of Gonococcic Vaginitis in New-Born. E. J. Wynkoop, Syracuse.—p. 421.

Immunity of Infants to Measles.—Herrman says that infants under 2 months of age, whose mothers have had measles, are immune; the immunity becomes less marked as they grow older, but that even at 4 or 5 months of age only 25 per cent. are infected. From that time the relative immunity quickly diminishes, so that infants over 9 months of age are as susceptible as older children. Artificially fed as well as breast-fed infants enjoy this immunity, with a slight difference in favor of the breast-fed infants. This relative immunity during the first months of life also manifests itself in other ways. When young infants are infected with measles, the incubation period may be longer, the fever and constitutional symptoms may be less marked, and the eruption, the catarrhal symptoms and buccal manifestations may be less distinct. The immune substances are probably chiefly conveyed to the fetus through the placental circulation. There is no substantial evidence that any important part of the immunity is due to the ingestion of breast milk.

Congenital Diaphragmatic Hernia.—Stimson reports a case of this sort occurring in a 11 months old baby. The heart and liver were found apparently in normal positions, and so were the pyloric and cardiac ends of the stomach. But the

greater curvature of the stomach had been pulled over to the right and some of the wall had been sucked up into the right chest cavity. A fluoroscopic examination showed the entire stomach in the chest, but there was apparently no obstruction to its emptying.

Ohio State Medical Journal, Columbus

19: 705-768 (Oct.) 1923

Exophthalmic Goiter. H. M. Korns, Cleveland.—p. 709.
Roentgen-Ray Therapy in Toxic Hyperthyroidism. H. K. Dunham, Cincinnati.—p. 713.
Surgery of Thyroid. E. R. Arn, L. G. Bowers and H. R. Huston, Dayton.—p. 717.
Treatment of Fracture of Lower End of Radius (Colles). B. G. Chollett, Toledo.—p. 728.
Nephrotomy. J. A. H. Magoun, Toledo.—p. 730.
Conservative Treatment of Maxillary Sinus Disease. J. D. Fouts, Dayton.—p. 732.

Philippine Journal of Science, Manila

23: 309-405 (Oct.) 1923

Some Philippine Species of Genus Musca Linnaeus. W. S. Patton.—p. 309.
Composition of Cashew Nut Oil. A. P. West and C. C. Cruz.—p. 337.
Jassoidea Related to Stenocotide. Malayan Species. C. F. Baker.—p. 345.

Rhode Island Medical Journal, Providence

6: 147-162 (Oct.) 1923

Diathermy in Pneumonia. H. E. Stewart, New Haven, Conn.—p. 151.

Surgery, Gynecology and Obstetrics, Chicago

37: 429-578 (Oct.) 1923

*Radical Operation for Teratoma Testis. F. Hinman, T. E. Gibson and A. A. Kutzmann, San Francisco.—p. 429.
Fractures of Elbow Joint and of Lower End of Humerus. E. L. Gilcreest, San Francisco.—p. 452.
Acute (Puerperal) Inversion of Uterus. E. Evans, La Crosse, Wis.—p. 461.
*Chemical Changes in Blood of Man After Acute Intestinal Obstruction. R. L. Haden and T. G. Orr, Kansas City, Kan.—p. 465.
*Retroperitoneal Lipoma. L. A. Greensfelder and R. B. Bettman, Chicago.—p. 468.
Sarco-Carcinoma of Uterus. R. H. Jaffe, Chicago.—p. 472.
Case of Bilateral Congenital Total Absence of Fibulae. J. J. Nutt, New York.—p. 475.
*Surgery of Seminal Vesicles. Report of 135 Cases. J. H. Morrissey and F. W. Smith, New York.—p. 480.
Metastatic Hypernephroma. Bone Metastasis. A. Gibson, Winnipeg, Man., and J. C. Bloodgood, Baltimore.—p. 490.
Intra-Abdominal Adhesions. J. B. Deaver, Philadelphia.—p. 506.
Collateral Circulation in Chronic Obstructon of Pulmonary Veins. Relation to Air Embolism Following Various Diagnostic and Therapeutic Procedures (Pneumolysis). K. Schlaepfer, Baltimore.—p. 510.
Reduction of Fractures with Fluoroscope. E. L. Eliason, Philadelphia.—p. 521.
Congenital Facial Clefts. V. P. Blair, St. Louis.—p. 530.
Rupture of Urethra. J. H. Garlock, New York.—p. 533.
New Gastro-Enterostomy Clamp. C. A. Roeder, Omaha.—p. 538.

Radical Operation for Teratoma Testis.—Seventy-nine cases of the radical operation for teratoma testis have been collected by Hinman and his associates. Ten of these were personal cases. Comparison of results of simple castration and radical operation shows, even at this early date for the latter, an improvement in the prognosis of at least 100 per cent. since about 15 per cent. of cases are cured by simple castration, and at least 30 per cent. of the seventy-nine cases analyzed are found to have been cured by the radical operation.

Chemical Blood Changes in Acute Intestinal Obstruction.—Haden and Orr state that definite blood chemical changes are found in acute intestinal obstruction, manifested by a fall in the blood chlorids, often a rise in the carbon dioxid combining power of the plasma and a rise in the nonprotein nitrogen. The fall in chlorids is considered the chief factor of this change and indicates that the chlorids may be utilized by the body as a protection against the toxic agent. The administration of sodium chlorid in larger doses than that supplied by physiologic solution of sodium chlorid is indicated in acute intestinal obstruction as a means of directly combating the toxemia. Since alkalosis is frequently present in intestinal obstruction, alkalies should be administered with caution. The authors have estimated that in the presence of the toxemia of intestinal obstruction sodium chlorid in an initial dosage of 1 gm. per kilogram of body weight should be administered. The blood and urine chlorids should be closely followed to estimate the subsequent quantity of sodium chlorid needed to keep the blood chlorids at a normal level.

Retroperitoneal Lipoma.—Retroperitoneal lipomas are most apt to occur in elderly persons and usually in women. The symptoms are vague and varied, swelling of the abdomen being the most constant. The prognosis is poor. The operative mortality is about 15 per cent. as a result of the likelihood of injury to the large abdominal blood vessels. Recurrences are frequent. The tumor may be pure lipoma but is apt to be a mixed tumor; sarcomatous degeneration is likely to occur. The tumor may arise from almost any retroperitoneal location but most frequently has its origin in the pararenal fat. Clinical diagnosis is difficult.

Surgery of Seminal Vesicles.—Morrissey and Smith assert that in their large series of cases with bacteriologic findings, the improvements noted in a large proportion of the cases justify the establishment of the operation and its more frequent use in selected cases.

U. S. Naval Medical Bulletin, Washington, D. C.

19: 393-650 (Oct.) 1923

Roentgenologic Study of Infectious Arthritis. F. W. Muller.—p. 393.
*Antimalarial Campaign in Haiti. A. H. Allen.—p. 402.
Malaria Parasite in Haiti. R. B. Storch.—p. 407.
*Samoan Conjunctivitis. D. Hunt.—p. 410.
Blackwater Fever. G. E. Robertson and W. Moore.—p. 413.
Experiences with Malaria Among Natives of Haiti. R. B. Storch.—p. 415.
Amebic and Bacillary Dysentery. J. G. Smith.—p. 423.

Antimalaria Campaign in Haiti.—The results of an eight months' campaign against malaria in Haiti, although limited in scope, Allen says, has demonstrated that it is possible to reduce malaria in a highly malarial country by the administration of quinin as described by Bass, even though restricted to relatively small areas.

Samoan Conjunctivitis.—Hunt's study of cases has furnished evidence that Samoan conjunctivitis is due to a gram-negative diplococcus, in all probability an attenuated form of the gonococcus.

West Virginia Medical Journal, Huntington

18: 169-224 (Oct.) 1923

Surgery of Gallbladder. Analysis of 100 Consecutive Operations. W. H. St. Clair and R. O. Rogers, Bluefield.—p. 169.
Diagnosis of Surgical Conditions of Kidney and Ureter. B. S. Brake, Clarksburg.—p. 176.
Diagnosis and Treatment of Renal Calculus. J. E. Rader, Huntington.—p. 182.
Fourth or Physiologic Era in Surgery. R. T. Morris, New York.—p. 189.
Mental Healing and Other Cults. H. M. Hall, Wheeling.—p. 197.

Wisconsin Medical Journal, Milwaukee

12: 193-244 (Oct.) 1923

Aids to Diagnosis in Medicine. H. E. Tuley, Louisville.—p. 193.
*Present Status of Management of Diabetes Mellitus. H. M. Coon, R. L. Gilman, W. M. Middleton, O. V. Overton and E. L. Sevringhaus, Madison.—p. 202.
Surgical Judgment. J. H. Gibbons, Philadelphia.—p. 208.
Malign Cellular Malfunction. J. L. Yates, Milwaukee.—p. 211.
*Some Difficulties in Diagnosis of Chronic Gallbladder Disease. D. Fisher and M. W. Snell, Milwaukee.—p. 215.
Insulin Treatment in Postoperative (Nondiabetic) Acidosis. D. Fisher and M. W. Snell, Milwaukee.—p. 220.

Diet Essential in Treatment of Diabetes.—That the introduction of insulin has in no way reduced the dietetic limitations of the diabetic is emphasized by Coon and his associates. While the range and variety of food may be greatly enhanced by the exhibition of insulin, the tendency of physicians to treat the newer biologic product as a short cut in management of diabetes is unjustified.

Insulin Causes Disappearance of Acidosis.—Fisher and Snell report an instance in which hypodermic administration of insulin, together with intravenous injection of glucose, caused the disappearance of severe acidosis in twelve hours in a nondiabetic patient operated on for gangrenous appendicitis.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 739-790 (Oct. 27) 1923

Relations of Surgery and Physiology. E. S. Schafer.—p. 739.
Chronic Intestinal Stasis and Cancer. W. A. Lane.—p. 745.
Present Position of Vitamin Problem. F. G. Hopkins.—p. 748.
*Regulating and Reflex Process. IV. Nerve Centers. P. T. Herring.—p. 751.
*Report of Three Necropsies Following Carbon Tetrachlorid Treatment. J. F. Docherty and L. Nicholls.—p. 753.
Factors Contributing to Recent Decrease in Infantile Mortality. J. Wheatley.—p. 754.
*Value of Watercress as Food. H. Scurfield.—p. 759.
Effect on Health of Sewer Air and Drain Air. F. E. Wynne.—p. 760.
Carbon Monoxid Predisposing Cause of Pulmonary Tuberculosis. E. B. Hazleton.—p. 763.

Sensation and Reflex Action.—Herring points out that sensation and reflex action are closely bound up together. Even visceral reflexes may be productive of sensation. Alterations in the heart beat, palpitation, respiratory disturbances, vasoconstriction and vasodilatation give rise to subjective phenomena. Irritability, exhaustion and depression are of common occurrence in ill health. The fatigue of a synapse renders that synapse more resistant to the passage of a nerve impulse, and fatigue of the afferent pathways should be a negation. But fatigue and the sensations met with in ill health are positive sensations and not mere negations. They are, as a rule, general and not localized to any particular part. Their cause is unknown, but must be sought in some alteration in the afferent nerve impulses affecting the conscious state.

Carbon Tetrachlorid Causes Fatty Liver.—With the object of confirming the report that carbon tetrachlorid may produce pathologic lesions of the liver, a number of condemned prisoners were treated with small doses of the drug. Postmortem examinations were made by Docherty and Nicholls on three of the prisoners. Each prisoner received 4 c.c. of carbon tetrachlorid, followed in two hours by 2 ounces of saturated magnesium sulphate solution. In two cases the liver showed fatty degeneration. In the third case there were no changes in the liver or kidney.

Watercress a Valuable Food.—Scurfield urges the greater use of watercress, which contains all three vitamins, as a food. Watercress is a cheap green vegetable which, like lettuce, is eaten unspoiled by cooking, but which, unlike lettuce, is available all the year round. Its more extended use may, therefore, be an appreciable help in remedying dietary errors caused by urbanization.

Journal of Pathology and Bacteriology, Edinburgh

26: 433-556 (Oct.) 1923

Organisms of Fowl Typhoid Group. R. S. J. Brooks and M. Rhodes.—p. 433.
*Vitamins and Bacteria Growth. G. W. Wyon.—p. 441.
*Diphtheria Toxin Production on Douglas Medium. A. F. Watson and U. Wallace.—p. 447.
*Structure of Thyroid in Man. G. S. Williamson and I. H. Pearse.—p. 459.
Healing of Uterine Wound: Mitosis in Unstriped Muscle. D. M'Intyre.—p. 471.
Primary Liver Cell Adenoma (Hepatoma). A. F. B. Shaw.—p. 475.
Relation of Deprivation of Vitamin B to Body Temperature and Bacterial Infection. G. M. Findlay.—p. 487.
Composition of Bacillus Welchii Toxin. H. Henry.—p. 497.
*Pathogenesis of Primary Pneumococcal Peritonitis. J. E. M'Cartney.—p. 507.
Presence of Heterophile Antigen in Bacteria; Shiga's Dysentery Bacillus; Forssman Antigen and Antibody. T. Iijima.—p. 519.
*Cutaneous Hypersensitiveness in Enteric Infections; Enteric Carriers. W. M'Kendrick.—p. 535.
Neuroblastoma of Thoracic Cavity. J. S. Anderson and T. Shennan.—p. 545.
Leukocytosis in Myeloid Leukemia. A. Piney.—p. 546.

Vitamin B and Bacterial Growth.—Evidence is given by Wyon that vitamin B does not favor the growth of bacteria. Attention is drawn to certain factors in complex organic materials which are or may be responsible for their value for bacteria.

Diphtheria Toxin Production on Douglas Medium.—The value of the medium prepared by Hartley's modification of Douglas' method for preparing high grade diphtheria toxin over long periods of time is demonstrated by Watson and Wallace. Two methods which have given satisfaction over a period of a year for the large scale preparation of this medium are given. This medium is of value for ordinary routine purposes and would appear to afford an efficient, inexpensive and readily prepared substitute for ordinary peptone medium.

Structure of Thyroid in Man.—The thyroid organ has been shown by Williamson and Pearse to contain a definite functional unit, of which the vesicle of the literature forms no fundamental part. The functional unit is a lymphatic sinusoid, in which the epithelium floats enmeshed in a specific plexus of capillaries. The secretion of the thyroid organ is produced and stored in a specific fashion. It is not the same as colloid. Colloid matter is stored after another manner; it is possibly a vehicle for the carriage of some metabolite.

Pathogenesis of Primary Pneumococcal Peritonitis.—M'Cartney asserts that primary pneumococcal peritonitis affects only females and the infection reaches the peritoneum from the vagina.

Cutaneous Hypersensitiveness in Enteric Infections.—A method of testing for hypersensitiveness of the skin to organisms of the typhoid group is described by M'Kendrick and the criterion of a positive reaction is defined. According to the procedure employed, positive reactions were constantly obtained in patients suffering from enteric fever and in chronic carriers. The test appears to be highly specific. There is no correspondence between the result of the skin test and the presence of pyrexia in acute cases, or between the skin test and the Widal reaction in carriers. The results indicate that early in convalescence from enteric fever the skin test becomes negative. It is suggested that patients who are convalescing from enteric fever should be examined for the skin reaction. A positive skin reaction in persons apparently in good health suggests that they are enteric carriers.

Lancet, London

2: 865-914 (Oct. 20) 1923

Wisdom of the Body. E. H. Starling.—p. 865.
Early Treatment of Mental Disorder. J. G. P. Phillips.—p. 871.
*Acute Bacillus Coli Infection of Gastro-Intestinal Tract. R. Chalmers.—p. 874.
*Treatment of Sprue. H. H. Scott.—p. 876.
Congenital Dislocation of Hip: A New Apparatus. J. Gilmour.—p. 879.
High Blood Pressure. E. M. Brockbank.—p. 880.
Village Settlements for Consumptive. Economics of Training. C. Varrier-Jones and C. Allbutt.—p. 912.

Colon Bacillus Infection of Gastro-Intestinal Tract in Infants.—Chalmers believes that many of the gastro-intestinal disturbances of early infancy are the result of toxemia in the mother acting on the fetus in utero. Early jaundice, flatulence, vomiting and difficulty in finding a suitable diet are always more in evidence in children of mothers who were in a toxic state during pregnancy than in others. Whether the infection is antenatal, natal, or postnatal it is often difficult to say; all three seem to be possibilities. A streptococcus infection is often combined with a *Bacillus coli* infection in the mother in these cases—the streptococcal infection being primary and the *B. coli* infection secondary. That the uterine discharge contains streptococci and colon bacilli shows the possibility of the child becoming infected with mucus in its sojourn in the maternal passages.

Calcium Lactate and Parathyroid Extract for Sprue.—An excessive protein diet (in India, Ceylon, and other parts of the East), or a diet containing an excess of fat, largely contributed to by the method of cooking the food, Scott regards as factors in the production of sprue. The treatment he uses consists of calcium lactate, 10 grains three times daily, and 1/10 grain parathyroid extract twice daily.

Tubercle, London

5: 1-56 (Oct.) 1923

Progress of Surgery of Lungs and Pleural Cavity. H. M. Davies.—p. 1.
Anesthesia in Thoracic Surgery. L. W. Shelley.—p. 13.
Thoracic Suppuration and New Growths.—p. 22.

Bulletin Médical, Paris

37: 1001-1012 (Sept. 1) 1923

*Examination of the Diaphragm. C. Achard and L. Binet.—p. 1003.
Raynaud's Disease. Laignel-Lavastine.—p. 1004.
Treatment of Cardiac Insufficiency. J. Walser.—p. 1006.

Examination of the Diaphragm.—Achard and Binet discuss the methods of examining the movements of the diaphragm. The abdominal (diaphragmatic) type of respiration in men and the thoracal in girls are secondary sexual characters which develop very early; they can be easily observed in crying nurslings. The normal protrusion of the abdomen during inspiration and the rocking aspect of the expanding thorax and contracting abdomen in paralysis of the diaphragm are familiar. Another type of this alternating or rocking movement occurs sometimes in ascending paralysis, when the muscles of the chest are already affected, while the diaphragm is working normally. In such cases the thorax is depressed during inspiration, while the abdomen expands. In doubtful cases, Paillard's test may be of value. The hand is applied on the navel, the fingers under it, and the physician presses the viscera against the diaphragm. If there is no organic or functional (juxtadiaphragmatic inflammations) paralysis of the diaphragm, the hand feels its inspiratory pressure after five to fifteen seconds. Hess' reflex consists in the retraction of the xiphoid process by the retrosternal fibers of the diaphragm when the nipple or its region is tickled. Radioscopy gives, of course, the best information about the diaphragm.

Lyon Médical

132: 725-768 (Aug. 25) 1923

*Masked Lesions of Semilunar Cartilages. L. Tavernier.—p. 725.
Streptococcal Thyroiditis. J. Rebattu and R. Gaillard.—p. 729.

Masked Lesions of Semilunar Cartilages.—Tavernier discusses lesions of the semilunar cartilages of the knee, which are not extensive enough to cause the characteristic impossibility of full extension. These forms present sometimes as recurring hydrarthrosis; sometimes they are diagnosed as sprains, though there is no reason for their recurrence. A "rheumatic" pain localized always at the same spot, in one joint, is not rheumatic. Walking increases it, rest and sedatives abolish it. Ablation of the diseased cartilage cures the condition.

Progrès Médical, Paris

433-444 (Sept. 1) 1923

*Infected Gastric Ulcers. F. Ramond.—p. 433.
Sympathetic Syndromes. Laignel-Lavastine.—p. 434.
Calculus in Common Bile Duct. Delbet.—p. 437.
Treatment of Encephalitis with Blue Colloidal Gold. Weinberg.—p. 440.

Infected Gastric Ulcers.—Ramond exposes the danger of operations in cases of infected gastric ulcers. Infection is the cause of recurrences of ulcers, and it may be most marked in hypacidity of the stomach, because the acid juice acts as an antiseptic. Severe infections cause violent pains with dorsal irradiations and vomiting, and they end frequently with hematemesis, which brings relief. Bicarbonates do not attenuate the pains in many such cases. The treatment consists in absolute rest and external application of ice.

Schweizerische medizinische Wochenschrift, Basel

53: 833-856 (Sept. 6) 1923

Radiotherapy of Dermatoses. Du Bois.—p. 833.
Radium in Dermatology. A. Lassueur.—p. 836.
*Bacteriology of Lochia. C. Meili.—p. 842.
*Heredity of Anomalies of Eye Refraction. W. Jablonski.—p. 846.

Bacteriology of Lochia.—Meili examined in infected abortions the uterine secretion (not the vaginal) for the presence of aerobic and anaerobic streptococci and liquefying staphylococci. If they are absent, there is no danger in immediate evacuation of the uterine cavity. If they are present, he treats conservatively as long as the fever lasts.

Heredity of Anomalies of Eye Refraction.—Jablonski considers—in spite of his small material—myopia as a hereditary recessive character.

Annali di Nevrologia, Naples

40: 65-193 (Aug. 31) 1923

*Instincts and Neuroses. F. Baldi.—p. 65.
*Postencephalitic Parkinsonism. L. R. Sanguineti.—p. 87.
Lesions of Conus Medullaris and Cauda Equina. A. M. Coen.—p. 146.

Instincts and Neuroses.—Baldi considers the traumatic war neurosis a clear example of the working of a "defense instinct." Mental health depends on an equilibrium between the instinctive tendencies and the forces which control them. The neurosis is an expression of predominance of the biologically older instinctive forces over the more recent higher psychic qualities.

Postencephalitic Parkinsonism.—Sanguineti found that the mental functions of the patients with postencephalitic parkinsonism, whom he examined, were not injured qualitatively, but only quantitatively. The psychic processes are sluggish and easily fatigued.

Pediatria, Naples

31: 857-912 (Aug. 15) 1923

*Micro-Organism of Scarlet Fever. M. B. Sindoni.—p. 857.
*Wassermann Reaction in Human Milk. M. Cotellessa.—p. 860.
Action of Roentgen Rays on Respiratory Metabolism in Tuberculous Children. A. Corica.—p. 868.
Grancher's Splenopneumonia. A. de Capite.—p. 881.
Intradermal Reaction in Pertussis. G. Garzia.—p. 890.
Sarcoma of Superior Epiphysis of Tibia. N. Caprioli.—p. 893.

Micro-Organism of Scarlet Fever in the Eruption and in the Scales.—Sindoni placed scales from scarlet-fever patients in salt solution, and incubated them for twelve to twenty-four hours. She found then the micro-organisms described by Di Cristina, Caronia and herself in scarlet fever. The diplococcic forms were gram-positive. Inoculation of Tarrozzi-Noguchi media with filtrates induced the same turbidity, with few visible micro-organisms, as the inoculation of blood in their former experiments (mentioned in these columns Sept. 8, 1923, p. 864).

Wassermann Reaction in Human Milk.—Cotellessa examined the milk from eighty-nine syphilitic and twenty-one nonsyphilitic mothers. The Wassermann reaction with 0.5 and 1 c.c. of milk gave parallel results with the serum. He followed Rusca's technic (removing fat by centrifugation, avoiding inactivation).

31: 913-968 (Sept. 1) 1923

Amebic Dysentery in Young Children. S. Maggiore.—p. 913.
*Splenic Anemia in Infants. L. Auricchio.—p. 922.
*Luetin Tests in Inherited Syphilis. S. de Villa and A. Ronchi.—p. 938.
Postdiphtheric Paralysis. C. Benedetti.—p. 950.

Splenic Anemias of Infants.—Auricchio studied in infants the leukocytosis following injections of epinephrin and sodium nucleinate. He injected intramuscularly 20 cg. of nucleinate or 1 c.c. of a 0.1 per cent. solution of epinephrin in children under 2 years, and 30 cg. or 1.5 c.c. in older children. Four healthy children had an average increase of 3,000 leukocytes (mostly neutrophils, with a few younger cells) in three hours after the injection. In five cases of leishmaniasis, there were no changes; two tuberculous children had less of a reaction than the healthy ones, while in seven syphilitics the increase was very pronounced and prolonged, and numerous immature leukocytes and erythrocytes appeared.

Luetin Tests in Inherited Syphilis.—De Villa and Ronchi performed the intradermal luetin test and the Wassermann test in seventy-nine children with inherited syphilis, and in fifty controls. The luetin reaction was negative in some syphilitic children with a positive Wassermann reaction, but it was positive in other cases of certain syphilis with a negative Wassermann reaction.

Policlinico, Rome

30: 1153-1183 (Sept. 3) 1923

*Thermoprecipitation in Renal Tuberculosis. V. Jura.—p. 1153.
Typhoid Infection without Intestinal Focus. G. Belloni.—p. 1163.

Thermoprecipitation in Renal Tuberculosis.—Jura performed thermoprecipitation tests for tuberculosis in the urine of ninety-four patients. He followed Wiget's technic (boiling the sediment with an equal part of urine for two to three minutes, and filtering). Later he added a double or triple amount of salt solution instead of the urine, thus avoiding mistakes from phosphates. The test was positive in cases of tuberculosis of the kidneys, and negative in other conditions, including tuberculosis of other organs.

30: 425-484 (Sept. 1) 1923. Medical Section.

*Reflex Epilepsy. T. Pontano.—p. 425.
*Cerebrospinal Fluid in Multiple Sclerosis. Pisani.—p. 437.
Acute Paralysis in Leg in Tabes. G. Santangelo.—p. 445.
Mechanism of Colloidal Reactions in Cerebrospinal Fluid. D. Pisani. —p. 452.

Reflex Epilepsy.—Pontano's experiments on a patient suffering from a glioma of the sensorimotor zone convinced him that reflex epilepsy can be provoked only from zones in the skin corresponding to the affected parts of the cerebral cortex.

Cerebrospinal Fluid in Multiple Sclerosis.—Pisani confirms the fact that a positive colloidal (mastic) reaction may be the only biologic reaction present in the cerebrospinal fluid in epidemic encephalitis, multiple sclerosis, or syphilis and metasyphilis of the central nervous system. The protein content of such fluid is small, when compared with the intensity of the colloidal reaction. The opposite is true in all other affections of this system.

Riforma Medica, Naples

39: 841-864 (Sept. 3) 1923

The Meinicke Reaction. A. Oro.—p. 841.
*Fuchsinophil Corpuscles in Sputum. A. Zuppa.—p. 850.
Hysteria. A. Ferrannini.—p. 851.

Fuchsinophil Corpuscles in Sputum.—Zuppa confirms the presence of acid-fast corpuscles in the sputum of tuberculous patients. The corpuscles are of different sizes. Decoloration with a 20 per cent. alcoholic solution of lactic acid for two minutes differentiates them from similar corpuscles in nocardiosis, which are not so resistant.

Archivos Españoles de Pediatría, Madrid

7: 385-448 (July) 1923

*Sarcoma of the Fibula. J. Ricsalido.—p. 385.
*Variations in Weight in Children. C. Sainz de los Terreros.—p. 392.
*Presclerosis of the Tympanum. A. Martin Calderín.—p. 398.

Sarcoma of the Fibula.—The leg of the girl, aged 8, had been enlarging for a year; roentgen rays revealed a large central myelogenous sarcoma with the periosteum intact, although stretched to the utmost. The soft parts were intact, and the gap in the bone after resection was bridged with a strip taken from the tibia of the other leg. Bony union at each end was apparent when the plaster cast was removed after three months, and normal use of the limb was soon regained.

Abrupt Fluctuations in Weight of Children.—Normal children never present sudden and striking changes in weight. When sudden changes occur, some morbid cause must be sought. Acute intestinal disorders are usually responsible in infants. Rapid recuperation of weight does not always signify cure; it may be due to retention of water. In health, two thirds of the fluid ingested is excreted through the kidneys, and one third by the lungs, skin and intestine. In disease, this proportion is altered, and the balance of water metabolism is upset. Even if water is supplied freely to a dehydrated infant, it may not be taken up by the tissues unless it contains a little salt or carbohydrate. Retention of water realized by using a saline solution may mask the child's true condition, and may even derange kidney functioning.

Presclerosis of the Tympanum.—Martin Calderín urges the importance of early recognition of progressive deafness in children, as prompt measures may arrest the tendency to otosclerosis. The stage of curable presclerosis is brief; it is usually associated with adenoids and an inherited tendency to otosclerosis. He describes a typical case in detail in a boy, aged 8. Air conduction of sound was reduced, and high sounds were heard better than low sounds. The chain of ossicles seemed normally movable, the tympanum almost normal, and the tubes permeable. The slow and progressive nature of the deafness and the predominance of the functional over the anatomic changes justified the assumption of presclerosis. He was treated with iodin, peptone and calcium; marked improvement was evident in two months, and clinical cure was complete in four. The boy seems to have been rescued from progressive deafness, thanks to the early diagnosis and treatment. The father was totally deaf from progressive sclerosis, and the parents had been on the watch for deafness in the child.

Revista Española de Medicina y Cirugía, Barcelona

6: 365-428 (July) 1923

*Primary Tuberculous Epididymitis. Rafael Molla.—p. 365.
*Protein Therapy in Ophthalmology. P. Bufill.—p. 371.
Syphilitic Disease of Arteries. H. Rosin.—p. 381.
Chlorin Treatment of Infectious Diseases. A. Salvat y Navarro.—p. 389.

Operative Treatment of Tuberculous Epididymitis.—Molla calculates that the testis is spared in fully 80 per cent. of the cases of primary epididymitis. Radical treatment does not require more than removal of the epididymis and vas deferens, leaving intact the testis and all the vessels and nerves in the spermatic cord. The circulation of both blood and lymph is quite distinct in testis and epididymis. "With primary tuberculosis of the latter, partial operations intending to be conservative, conserve nothing but the tuberculosis. The function of the epididymis is lost by the infectious process and the partial operation as effectually as after radical epididymectomy, but the latter answers its purpose only when the vas deferens is removed in addition." Even when the seminal vesicles and the prostate are involved, these may heal after removal of the epididymis, just as the bladder heals after removal of the tuberculous kidney. In one case even the testis was invaded, but this was cauterized, and the man recovered completely under heliotherapy after removal of the epididymis and vas deferens. In 3 of his cases, erection and ejaculation proceed apparently normally although the epididymis and vas deferens on both sides were removed. In Marion's 70 cases the testis was involved in only 20 per cent., and in 6 of Molla's 11 cases. In one case there has been no recurrence of genital tuberculosis after the bilateral epididymectomy, but the right kidney has had to be removed. This organ was probably tuberculous at the time of the genital operation two years ago, but had caused no symptoms at the time.

Parenteral Protein Therapy in Disease of the Eyes.—Bufill published twenty cases in 1921, and he says that he has been growing more enthusiastic on the subject ever since. He usually injects 2 gm. of the milk, repeating this daily. The injection is made in the gluteal muscle, and suppuration has never occurred in his experience. He gives thirty case histories, and extols the prompt benefit in syphilitic papillitis, traumatic iridocyclitis, etc. In two of the cases described, enucleation would have been inevitable otherwise, but he succeeded in saving the eye in one case and in saving partial vision in the other. These patients were children; the eye had been hit with a stick.

Semana Médica, Buenos Aires

2: 41-80 (July 12) 1923

*Acute Pericarditis. A. Casaubon.—p. 41.
*Argentine Gynecology. A. Chueco.—p. 46.
Simple Apparatus for Blood Transfusion. E. L. Sabate.—p. 49.
*Secondary Hydrocephalus in Infant. J. M. Macera.—p. 52.
*Sclerocystic Ovaritis. M. Vásquez Amenábar.—p. 55.
The Infant. J. C. Navarro and F. Bazán.—p. 56. Cont'n.
Model for an Infants' Hospital. F. Schweizer.—p. 62.
Tribute to Pasteur. M. E. Pignetto.—p. 64.

Acute Pericarditis.—Casaubon remarks that few diseases have so many symptoms as pericarditis with effusion, and yet the differential diagnosis is often masked by the preceding pneumonia in infants. In older children, the pericarditis is generally of rheumatic origin, and the subsidence under treatment does not guarantee against adhesion later. In rheumatic cases, puncture is seldom necessary, but otherwise it is almost indispensable.

Progress in Operative Gynecology in Argentina.—Chueco declares that the use of clamps at abdominal operations shows that the operator is behind the times. Only very rarely and then only a single clamp should be used; the same applies to ligatures. The Argentine school, he explains, has progressed beyond this. They terminate the operation with the complete correction of conditions: Hemostasis is realized by fitting peritoneum over both layers of the broad ligament and ligating its large vessels at the same time. This leaves the ligaments and the posterior vagina in their natural position but outside of the peritoneum. The Argentine school has further perfected the technic of vaginal operations. Chueco removed harmlessly by this route the largest ovarian

dermoid cyst on record, with the largest bone content. Calcagno and others correct retroversion of the uterus and prolapse by the vaginal route. Reexamination ten years ago of 200 women after colpotomy for these reasons in preceding years failed to reveal any interference with pregnancy or delivery for which the intervention by the vaginal route could be incriminated. The number of cases has much increased since then. The vesico-uterine tissue is separated through the anterior colpotomy, and the peritoneum is opened. The uterus and adnexa are then pivoted forward and outside of the vulva, and then the broad ligaments are slit to allow the round ligaments to be drawn through and sutured, shortened, to the posterior wall of the uterus. Chueco adds that the South American nations are the only ones that possess a group of operators who study the indications and the contraindications for the special mode of access in each individual case, equally skilled in abdominal and vaginal technics.

Secondary Hydrocephalus in Infant.—Necropsy cleared up the case in the infant, aged 6 months, revealing a glioma in the fourth ventricle, blocking the circulation of fluid.

Treatment of Sclerocystic Ovaritis.—After failure of other measures, Vásquez Amenábar drew the ovary out, and with the tip of the actual cautery punctured every cyst that could be palpated. In the following year 20 of the 25 patients thus treated complained of recurrence of symptoms. Since then partial resection has been tried, but recurrence soon followed in 20 of the 41 cases thus treated, but only in 20 per cent. of the 10 cases in which ligamentopexy had been done in addition. This suggested that checking the circulation might tend to prevent recurrence, and there has been nothing to suggest further disturbances in 25 of 37 thus treated, many of them more than three years ago. He ligated half of the arteries entering the hilum of the ovary, and the results confirm the assumption that congestion of the organ is the main factor in this class of lesions.

Deutsche medizinische Wochenschrift, Berlin

49: 839-870 (June 29) 1923

Tender Points in Diagnosis. Goldscheider.—p. 839. Idem. Tellgmann.—p. 843.
*Action of Drugs on Bile. A. Bickel and T. Watanabe.—p. 844.
Pathology of Jaundice. K. Retzlaff.—p. 844.
Pyuria in Children. E. Faerber and D. Latzky.—p. 847.
Osteochondritis Coxae: Coxa Plana. A. Nussbaum.—p. 849.
Colloidal Mercury in Syphilis. L. Zweig.—p. 851.
Stain for Tubercle Bacilli. F. Konrich.—p. 852.
Action of Scilla. Engelen.—p. 854.
Protein Treatment in Sinus Affection. R. Terbruggen.—p. 854.
Blood Calcium Determination. O. Strauss.—p. 855.
Radiotherapy of Tuberculosis. R. Weiss.—p. 855.
Tuberculosis in the Netherlands. Prinzing.—p. 858.
American Journals in Germany. Jürgens.—p. 860.

Action of Drugs on Secretion of Bile.—Bickel and Watanabe find that the drugs which act on the sympathetic and parasympathetic systems have little influence on bile secretion. They have a pronounced influence on the musculature of the ducts.

49: 1107-1140 (Aug. 24) 1923

*Insulin Treatment in Diabetes. O. Minkowski.—p. 1107.
Complement Fixation in Echinococcal Infection. J. van der Hoeden.—p. 1108.
*Acidity with Gastric Ulcers. D. D. Pletnew.—p. 1109.
*Gastric Ulcer. R. F. Weiss.—p. 1110.
Caseation of Glands in Axilla After Tuberculin. P. Schürmann.—p. 1110.
Sedimentation Speed in Tuberculosis. Tegtmeier.—p. 1113.
*Mechanism of Torsion of Organs. B. Tenckhoff.—p. 1115.
*"Speaking Phenomena" in Diagnosis. E. Weisz.—p. 1118.
*Pituitary Treatment. R. Klotz.—p. 1119.
Chronic Benzol Poisoning. Brücken.—p. 1120.
Electric Treatment of Neuralgia. Schurig.—p. 1121.
Treatment of Spring Conjunctivitis. Arpasi.—p. 1122.
Forceps for Transverse Position of Head. Pust.—p. 1122.
Recent Literature on Infectious Diseases. O. Moog.—p. 1123.
*Children of Minor Mothers. A. Wilsing.—p. 1125.

Insulin Treatment in Diabetes.—Minkowski, who, with Mering, discovered the diabetes that follows extirpation of the pancreas, reports his experiences with insulin. The Toronto authors have stated that in his early publications he avoided any mention of the mode of action of the pancreas. To correct this misapprehension, he quotes from his article in 1892 a sentence that refers to a "something produced by the pancreas which cooperates in the destruction of sugar."

Acidity with Gastric Ulcers.—Pletnew's material of 157 cases of gastric and duodenal ulcers demonstrates the possibility that an ulcer may develop with low acidity of the secretion. Hunger may lower the acidity, especially in cases of duodenal ulcers.

Gastric Ulcer.—Weiss finds that parenteral injections of foreign proteins are followed by a focal reaction in gastric and duodenal ulcers. Neurasthenics have only a general reaction.

Mechanism of Torsion of Organs.—Tenckhoff emphasizes the normal slight rotating movements in walking. These movements are responsible for the torsion of pedunculated cysts and organs. They explain also Küstner's law which postulates an opposite twist for tumors originating in the opposite sides of the body.

"Speaking Phenomena" in Diagnosis.—Weisz' observations on the visible changes of the outline of the thorax and abdomen during speaking, allow determination of the borders of the lungs and of exudates. He gives here a physiologic explanation.

Pituitary Treatment.—Klotz reports good results of pituitary preparations in states of collapse and intestinal paralysis.

Children of Minor Mothers.—Wilsing reviews the results of childbearing of twenty-five girls between 13 and 16 years old. Labor was easy, but two had convulsions afterwards. The infants were of normal size, and developed well physically. The frequent occurrence of mental diseases among such children is probably due to hereditary predisposition, which was already manifest in the early sexual instinct of the mother.

Deutsche Zeitschrift für Chirurgie, Leipzig

181: 145-288 (Aug.) 1923

Results of Gallbladder Surgery at Leyden. W. F. Suermondt.—p. 145.
Fibrous Osteitis; Two Cases. Warsow.—p. 178.
Roentgen Diagnosis of Peptic Ulcer. J. Palugyay.—p. 203.
Injury of Skull from Live Wire. H. Luther.—p. 220.
Operative Treatment of Fractures. H. Schäfer.—p. 238.
Surgical Treatment of Sciatica. Schüssler.—p. 256.
Perforation of Gastric Cancer. W. Horn.—p. 264.
Differential Diagnosis Between Ulcer and Cancer. Idem.—p. 264.
Varix in Jugular Vein. L. Sussig.—p. 281.

181: 289-426 (Aug.) 1923

*Fracture of Neck of Femur. H. Eggers.—p. 289.
*The Neurinoma Question. K. H. Erb.—p. 350.
*Two Unusual Cases of Ileus. A. Roseno.—p. 375.
*Embolism of Mesenteric Artery. Bruns.—p. 390.
*Extensive Resection of Small Intestine. A. Sohn.—p. 403.
*Injury of Small Joints. F. Kazda.—p. 413.
Hernia of Spigelius' Line. Thoret.—p. 420.

The Present Status and the Prospects of Treatment of Fracture of the Neck of the Femur.—Eggers' article is based on eighty-nine cases between 1905 and 1913, supplemented by a review of the literature. He compares the outcome of operative and conservative measures in thirty-nine and fifty cases, respectively. In a young patient, mechanical support with a peg, screw or suture should be tried with a mixed or intertrochanteric fracture, but with a fracture close to the head Lexer's nearthrosis operation is preferable. For the aged, decapitation and freshening of the acetabulum to induce healing by ankylosis is the method of choice; no peg or screw should be used. For the middle-aged, the location of the fracture determines the technic to be applied, with consideration whether there is a tendency to diabetes, arteriosclerosis or arthritis deformans; also whether cooperation on the part of the patient can be secured. If all conditions are favorable for recovery with a movable joint, Lexer's nearthrosis operation is most promising for subcapital fractures. If conditions are not favorable, he advocates Lorenz' bifurcation method, designed originally for irreducible luxation of the hip joint. (It was described in these columns, Sept. 22, 1923, page 1061.) Conservative treatment should be the rule for separation of the epiphysis; only when this fails should operative measures be considered. He urges others to compare the outcome of conservative and decapitation treatment of subcapital fracture. After removal of the head, is there often danger of atrophy of the neck? This occurred in one of his cases, nullifying the benefit from the operation. Even with pseudarthrosis there may be secondary resorption of neck tissue unless care is used not to impair the nourishment of the neck. It is impor-

tant to learn the functional outcome of the bifurcation technic and of Lexer's method. It might be possible to apply a walking plaster cast with the latter; this would raise the age limit suitable for the Lexer procedure.

The Neurinoma Question.—Three personal and forty-seven collected cases of neurinoma are compared by Erb. They are usually accompanied by other anomalies, from pigmented nevi to gliomas in the brain. In diagnosis of internal tumors, more heed should be paid to tumor growths in the skin. He classes neurinomas with neurofibromatosis. Malignant degeneration of a typical neurinoma has never been observed, but association with sarcoma is not uncommon.

Unusual Cases of Ileus.—In the first of Roseno's two cases there was axial torsion of a loop of the ileum, and this loop 12 to 15 cm. long sloughed off spontaneously. Necropsy showed a gap in the ileum of about 4 cm., but the twisting of the stumps had closed the lumen completely. The gap was bridged by omentum, while the cast-off loop was floating freely in malodorous fluid. The lumen must have been closed before the gangrenous loop sloughed off, as the peritonitis was comparatively restricted and mild, and the whole process occurred in the lower abdomen. Intercurrent bilateral parotitis was mainly responsible for the fatal outcome, four weeks after the ileostomy had apparently started the woman on the road to recovery. No attempt was made at the laparotomy to investigate the cause of the puzzling conditions encountered. Necropsy confirmed the wisdom of this, as otherwise the peritonitis would have been diffused. In another case of acute ileus, the woman, aged 37, recovered spontaneously after nine days of persistent vomiting, fecaloid for the first six days. The ileus followed evacuation of an effusion in the pouch of Douglas which developed after curettement on account of right adnexitis.

Embolism of Superior Mesenteric Artery.—Burns adds a third to the two cases he has found on record in which the segment of intestine affected by embolic obstruction of the superior mesenteric artery was successfully resected. The sudden agonizing pain, collapse, vomiting, tenderness in the right side, and a history of pains in the right side three weeks before suggested recurring appendicitis. No stools or flatus had been passed since the first symptoms twelve hours before. The patient was a boy, aged 11; the purplish segment of bowel resected measured 16 cm. The embolism involved the right colonic artery, but its source was not ascertained. Recovery was uneventful.

Extensive Resection of Small Intestine.—Sohn has collected eleven cases in which more than 2 meters of small intestine were resected since Flechtenmacher's compilation. This with a personal case described, brings the total to sixty-eight. In his own case nearly the entire jejunum and part of the ileum, 2.75 m., was resected. The stomach seems to retain the chyme longer and secretion is more profuse than in normal conditions; he regards this as a compensatory process. It confirms Stassoff's experimental experience. The young woman seems healthy now, a year later, and weighs a pound more than before.

Treatment of Wounds of Small Joints.—Kazda reports the outcome of treatment of ninety-five patients with cuts or crushing injuries involving joints in fingers or toes. When the suppurating joint was opened wide, it could be left to heal by granulation. But when the opening into it was small, a phlegmon developed in the capsule and total suppuration followed unless resection was done. If the ability to flex the joint has to be sacrificed, then resection hastens healing. The final outcome depends in large measure on the intelligence and perseverance of the patient. Children give the best results not only as to healing but as regards function later. Fragments of bone or cartilage must be removed. In one case the third, fourth and fifth fingers had been torn from the metacarpus with all the dorsal and volar soft parts, but they were replaced on their metacarpal heads with all the soft parts in place and only the skin was sutured. After primary healing the fourth and fifth fingers have regained good function; the third finger is still stiff. In another case the injury of the joint had been from an indelible pencil and serious disturbances followed in both soft parts and bones. Complete recovery followed excision of all the stained tissues and excochleation of the joint head into sound tissue, with immediate suture.

Medizinische Klinik, Berlin

19: 1181-1214 (Sept. 2) 1923

*Roentgen Ulcers. P. Leusden.—p. 1181.
*Procain in Diagnosis. M. Kappis and F. Gerlach.—p. 1184.
Pulmonary Changes in Children with Extrapulmonary Tuberculosis. K. Dietl.—p. 1192.
*Human and Bovine Tuberculin Tests. H. Koopmann.—p. 1193.
Ponndorf's Tuberculin Vaccination. Windrath.—p. 1196.
Injury by Hypnosis. M. Serog.—p. 1197.
Arsphenamin-Resistant Syphilis. W. Löwenfeld.—p. 1197.
Treatment of Angioneurotic Edema. F. Gerlach.—p. 1198.
Treatment of Gastric and Duodenal Ulcers. R. Fuchs.—p. 1199.
Theory of Seroreactions in Syphilis. H. Sachs.—p. 1200.
Survey on Goiters. K. Singer.—p. 1201.
Capillaries of Skin. E. Edens.—p. 1202.

Roentgen Ulcers.—Leusden finds that he has at times about as many patients to treat with roentgen rays as he has patients requiring treatment on account of sequelae of irradiations. The question of the roentgenologist's responsibility is very difficult. He believes in an individual oversensitiveness, and quotes his own intolerance of reflected light on the coast or at high altitudes. Yet he was able to work without precautions for four years with the roentgen rays. The operating surgeon knows at least what he is cutting. The roentgen rays act on the whole conglomerate of tissues. The terrific pains of roentgen ulcerations are due to the survival of nerve terminals over the rest of the tissue. The conservative treatment of such ulcers has no good results. A recent publication of a treatment which achieved almost the healing over of the ulcer in six months, demonstrates our modesty in estimating success. He treats such ulcers like malignant tumors, resecting if possible into healthy tissue, and supplements this with a plastic operation.

Paravertebral Injection of Procain in Diagnosis.—Kappis and Gerlach confirmed on over 100 patients Läwen's results as to the analgetic action of paravertebral injections of procain in certain abdominal affections. In disease of the stomach, the sixth to eighth thoracic segment must be injected. They confirm Läwen's interesting observation that it is sufficient in affections of the gallbladder, pylorus and duodenum to inject the right side only. Cholecystitis, stones in the common bile duct, etc., became painless after injections in the ninth to eleventh thoracic segment. Affections of the kidneys reacted to injections into the last thoracic and the first two lumbar segments. Appendicitis and gynecologic affections required more extensive infiltrations. Failures were rare, but injury of the pleura occurred in 4 per cent. of the patients.

Comparative Human and Bovine Tuberculin Test.—Koopmann was able to increase the number of positive tuberculin reactions by using a preparation of the bovine type in addition to the human tuberculin.

Münchener medizinische Wochenschrift, Munich

70: 1107-1140 (Aug. 31) 1923

*Functions of Stroma. M. Askanazy.—p. 1107.
*Genesis of Hydrocephalus. A. Dietrich.—p. 1109.
*Intracardiac Injection. H. Hohlweg.—p. 1110.
*Duodenal Tube in Diagnosis. K. Westphal.—p. 1113.
Sympathectomy in Treatment of Epilepsy. E. Forster.—p. 1114.
Subcutaneous Injections of Turpentine in Eye Disease. Behr.—p. 1116.
Estimation of Hemoglobin and Erythrocytes. K. Bürker.—p. 1118.
Live-Wire Injuries of the Skin. G. Riehl.—p. 1119.
Contagiosity of Infants' Tuberculosis. A. Bratusch-Marrain.—p. 1120.
Iodin Prevention of Goiter. Lutz.—p. 1121.
The Orthometer for the Heart. Lilienstein.—p. 1121.
Alleged Malpractice: Case VIII. A. Döderlein.—p. 1122.
"Isotopic Treatment of Tuberculosis." S. Widerøe.—p. 1123.
Experimental Pneumorhachis. Esau.—p. 1124.
"Bleeding After Delivery." Opitz.—p. 1124.
Liebig, Father of Scientific Nutrition. O. Krummacher.—p. 1124.
Social Insurance and Tuberculosis. Wilucki.—p. 1128.
Treatment of Nephritis in Children. M. Klotz.—p. 1127.

Functions of Stroma.—Askanazy reviews the old and new investigations on the function of the stroma. The primitive idea that its main function is to connect and support the parenchyma, has been left far behind. Protective mechanical and chemical cleaning is its most important function.

Genesis of Hydrocephalus.—Dietrich finds that the size of the hydrocephalus corresponds rather to the extension of the changes in the choroid plexus than to the seat of the occlusion. He agrees with Askanazy in the opinion that the plexus has resorptive functions. The common belief that it secretes the cerebrospinal fluid has so far no foundation except tradition. It is probable that the ependyma secretes the fluid.

Intracardiac Injection.—Hohlweg had a perfect result with intracardiac injection of 2 c.c. of camphorated oil in a case of shock during the filling of an artificial pneumothorax. The preferable point, he says, is the upper border of the fifth rib, close to the sternum.

Duodenal Tube in Diagnosis.—Westphal had some positive and negative results with cultures made from the duodenal juice (peptone reflex) in patients suffering or recovering from typhoid.

Wiener Archiv für innere Medizin, Vienna

6: 283-494 (July 1) 1923

*Metabolism in Tetany. H. Elias et al.—p. 283.
*Cheyne-Stokes Syndrome. S. Wassermann.—p. 303.
Typhoid Endocarditis. F. Redlich.—p. 335.
*Epinephrin in Blood. F. Högler.—p. 343.
Blood Colloids. J. Daniel and F. Högler.—p. 355.
Blood Gases. I. E. Freund and A. Simó.—p. 373. II.—p. 487.
Epinephrin Reaction. K.Csépai, B. Fornet and K. Tóth.—p. 383.
*Pathogenesis of Dysentery. M. Semerau.—p. 395.
*Charcot-Leyden Crystals. A. Neumann.—p. 407.
Retrograde Extrasystoles. R. Gussenbauer.—p. 423.
*Auscultation of Vowels. E. Fröschels and F. Stockert.—p. 427.
Diaphragmatic Hernia and Relaxation. H. Elias and K. Hitzenberger. —p. 437.
*Diaphragmatic Hernia. L. Reich.—p. 445.

Metabolism in Tetany.—Elias, Kornfeld and Weissbarth compared the composition of urine after drinking equivalent amounts of hydrochloric acid and sodium chlorid solutions. They found in normal subjects, as anticipated, a stronger increase in the acidity and ammonia content of the urine after ingestion of the acid. Slight disturbances (movements, fever) were sufficient to cause differences. In tetany, such changes are very frequent, and may be so marked that the patient eliminates less acid after taking the hydrochloric acid than after the salt.

Cheyne-Stokes Syndrome.—Wassermann considers inhalation of oxygen as a specific treatment for the Cheyne-Stokes syndrome. One must take care, however, to prevent the patient from tearing the mask off when he starts breathing. The usual heart tonics and stimulants may be used as adjuvants. Syphilitic etiology requires specific treatment. Opium and its derivatives, and all narcotics and hypnotics are strictly contraindicated.

Epinephrin in Blood.—Högler found that blood plasma from healthy persons inhibits the peristalsis of a segment of cat intestine (Dittler's method for determination of epinephrin). Plasma from patients with hypertension had a stronger action, while the plasma from two cases of Addison's disease was without effect.

Pathogenesis of Dysentery.—Semerau believes that the dysenteric changes in the intestines follow bacillemia.

Charcot-Leyden Crystals.—Neumann believes that the mother substance of the Charcot crystals is derived from the protoplasm of eosinophil cells during coagulation of blood. It seems to have some relation to the formation of fibrin.

Auscultation of Vowels.—Fröschels and Stockert report their investigation of the changes in the auscultation sounds of vowels in healthy persons. Karplus has reported changes of this kind in pneumonia and pleuritis. Only the continental A remains the same in auscultation of healthy subjects. The eventual changes are due to interference of air conduction and the resonance of the thorax.

Diaphragmatic Hernia.—Reich reviews the symptomatology of diaphragmatic hernia. Müller's experiment is the ideal method for determination of the functional condition of the diaphragm. The subject is asked to make an extreme expiration. Then, after closing his nose and mouth, he makes an inspiratory movement. In healthy persons, both sides of the diaphragm move then in the same direction or remain in place. In affections of one side of the diaphragm, the diseased side rises higher than the other. The literature is quoted extensively.

Wiener klinische Wochenschrift, Vienna

36: 585-602 (Aug. 16) 1923

*Complications of Tonsillectomy. W. Falta and F. Depisch.—p. 585.
*Idem. F. Schlemmer.—p. 589.
Anaphylaxis After Milk Injections. K. Schreiner.—p. 591.
Ascaris in Roentgenogram. J. Reiter.—p. 592.
Trombidiasis in the Alps. K. Toldt.—p. 592.

General Complications of Tonsillectomy.—Falta and Depisch publish eight histories of patients with nephritis, endocarditis or arthritis. In all of these cases the tonsillectomy or removal of infected roots of teeth was followed by an acute exacerbation of the disease. One of the patients was a physician who had pains in the joints only after expression of the tonsils and the operation, but never before. They attribute the acute exacerbation to an invasion of the blood by the germs during the operation. They believe that operative methods should be revised from this standpoint.

Idem.—Schlemmer points out that internal complications follow only after tonsillectomies which had been indicated because the tonsils were the probable source of the infection. He has seen pains in joints and elevation of the temperature in several instances after expression of tonsils. He considers this a serious intervention, saying that it is contraindicated in patients with latent tonsillogenous affections. He never grasps the tonsil in the first stage of tonsillectomy. He seizes the pillars of the fauces instead of the tonsils themselves. The tonsil can be grasped without danger of spreading the infection into the lymphatics when more than half of it is already freed.

Zentralblatt für Chirurgie, Leipzig

50: 1345-1384 (Sept. 1) 1923

Freezing of Nerves in Angiospastic Conditions. Läwen.—p. 1346.
Pseudarthrosis of the Scaphoid Bone. H. R. Schinz.—p. 1350.
Luxation of the Navicular Bone. F. Magenau.—p. 1354.
Metastatic Epulis. M. Weichert.—p. 1356.
*Laceration During Correction of Deformity. P. J. Schultz.—p. 1357.
Comparison of Methods of Protecting Surgeon's Hands. Klapp and Vogeler.—p. 1359.
Acute Postoperative Duodenal Paralysis After Billroth I. S. Kostlivj. —p. 1367.

Laceration During Redressement.—Schultz recommends immediate application of Thiersch epithelial flaps to lacerations occurring during forcible correction of deformities.

Zentralblatt für Gynäkologie, Leipzig

47: 1393-1440 (Sept. 1) 1923

Treatment of Prolapsed Uterus in the Aged. Labhardt.—p. 1394.
A Peculiar Type of Eclampsia. Koerting.—p. 1398.
Pregnancy in Rudimentary Accessory Horn. Conrad.—p. 1402.
Asepsis in Manual Removal of Placenta and in Version. B. Ragusa.—p. 1407.
Eye Disease and Induced Abortion. Eberhart.—p. 1409.
*Intra-Uterine Tamponing. E. Ekstein.—p. 1413.

The Indications and Technic of Intra-Uterine Tamponing.—Fritsch introduced intra-uterine tamponing chiefly to check hemorrhage in anemic women in febrile abortion cases in which evacuation of the uterus cannot be completed. The gauze keeps the os uteri open, and ovum remnants are removed simultaneously with the gauze. Fritsch leaves the gauze from three to four days after defervescence. Ekstein has used the method since 1891. He gives his indications as follows: In copious uterine hemorrhages that need to be checked quickly, irrespective whether the hemorrhage is caused by uterine disease or from retained remnants of the ovum; retention of remnants of the ovum when more or less profuse hemorrhages continue, often for several weeks; in induced interruption of pregnancy from the first to the fifth month; in hemorrhages resulting from atony of the uterus post partum; retention of secretions post partum or post abortum, and in febrile abortion, in place of all other forms of intervention, when the retention of remnants of the ovum or secretions cannot be ruled out with certainty. Ekstein regards intra-uterine tamponing as contraindicated in febrile inflammatory affections of the adnexa and the pelvic peritoneum. This contraindication arises from the fact that the

technic of intra-uterine tamponing always causes a displacement of the uterus and the adnexa.

Tohoku Journal of Experimental Medicine, Sendai

4: 275-416 (July 30) 1923

Blood Alcohol. K. Yamakami.—p. 275.
*Action of Pancreas Extract on Vessels. T. Oka.—p. 287.
Occurrence of Meningococci. S. Kondo.—p. 307.
*Glycogen Formation. II. K. Sato.—p. 312. III.—p. 347.
*Physostigmin and Ocular Pressure. Y. Hayashi.—p. 361.
*Camphor and Circulation. F. Nakazawa.—p. 373.

Action of Pancreas Extract on Vessels.—Oka found that extracts from the pancreas have a vasoconstricting action, which is substituted by a vasodilating action when the extracts were made at a temperature of 70 C. Extracts made with dilute acetic acid also had a vasodilating action. It was stronger and more constant than in extracts from other organs.

Glycogen Formation.—Instead of determining the amount of glycogen in particles of liver cut out serially during the course of the experiment, Sato used a series of animals, so that the one used had not been injured before. He found that infusions of glucose increase, at first slowly, then more rapidly, the glycogen content in the liver. This reaches its maximum in about three hours after the injection. Epinephrin prevents, and theobromin-sodium salicylate checks the formation of glycogen. Phlorizin did not inhibit it, in spite of the glycosuria, when given in suitable amounts.

Physostigmin and Ocular Pressure.—Hayashi investigated the action of physostigmin on the intra-ocular pressure in normal subjects. He found that it causes a transitory increase in pressure.

Camphor and Circulation.—Nakazawa finds that camphor paralyzes the formation and conduction of the impulse in frog's hearts, and in large doses stimulates the latent automatism. He believes that the favorable effects of camphor in strophanthin and aconitin poisonings are due to its paralyzing action on the abnormally irritated heart muscle.

Norsk Magazin for Lægevidenskaben, Christiania

84: 761-848 (Sept.) 1923

*Treatment of Chronic Leukemia. T. Brandt.—p. 761.
Incarcerated Hernia of Line of Spigelius. C. Bull.—p. 802.
Subcutaneous Emphysema. S. Laache.—p. 806.

Roentgen-Ray Treatment of Chronic Leukemia.—Brandt has had nine cases of chronic myelogenous and five of chronic lymphatic leukemia under observation for years before and after roentgen-ray treatment. Of the eight that have died, only one survived for thirty months after the disease had been diagnosed. The others died in less than two years. Roentgenotherapy, therefore, does not cure leukemia, but it improves the general condition, restores the earning capacity, and has a favorable action on the erythrocytes. Leukemia patients always eliminate more uric acid than normal, and this elemination becomes exaggerated under roentgen treatment. The latter is only symptomatic, and it is contraindicated in acute leukemia, and should be suspended if the general condition shows aggravation, but a loss of 3 or 4 pounds in the first week need not be heeded. One woman with leukemia was delivered of healthy twins, after which the disease became graver. A trial of convalescents' serum gave negative results.

Ugeskrift for Læger, Copenhagen

85: 653-668 (Sept. 13) 1923

*Composition of Spinal Fluid. A. V. Neel.—p. 653. Conc'n, p. 669.
Case of Myeloid Leukemia. K. Hrolv.—p. 660.

Composition of Spinal Fluid.—Neel cites what the authorities have to say on the cell and albumin content of the normal spinal fluid. These statements are often conflicting, and he compares them with the tabulated findings in 1,118 various nonsyphilitic nervous affections he has investigated, with or without syphilis in addition, or epidemic encephalitis, and 699 normal controls. Whenever the number of cells was over one in 3 c.mm., there was always evidence of syphilis or other organic disease. In the normal fluids there was no globulin but the albumin was frequently found up to 10. This formula: cells none or up to one third cell per c.mm.; globulin, 0, and albumin, 10, had so few exceptions that he regards it as dependable to exclude organic disease. The tests were made without knowledge of the source of the fluid. They apparently demonstrated that normal spinal fluid has a remarkably constant composition in respect to cells and albumin. He warns that, as with many other tests, only positive findings are decisive.

85: 669-684 (Sept. 20) 1923

*Competitive Examination for Professorship. C. Gram et al.—p. 679.
*Delirium Tremens at Copenhagen. K. H. Krabbe.—p. 679.

Selection of a Professor in Denmark.—The complicated procedure for selecting a successor to Prof. C. Gram was commented on editorially, Oct. 27, 1923, p. 1444.

Denmark's Successful Fight Against Alcoholism.—Krabbe relates that prohibition was decreed in Denmark in 1917. The decree absolutely prohibiting the sale and importation of alcohol was dated Feb. 27, 1917, but in less than a month this decree was revoked, and the only restriction on alcohol then imposed was to raise the retail price of strong liquors about fifteen-fold. People stopped buying liquor then, and the fight against alcohol was won, without restrictive laws. Krabbe presents as evidence to prove these statements the record of cases of delirium tremens at the public hospital at Copenhagen. Whereas, from 1903 to 1916, inclusive, there had never been less than 249 cases of delirium tremens in any year, and the number sometimes reached 447, in 1917 it dropped to 82; to 9 in 1918; 11 in 1919; 18 in 1922. The previous hard drinkers said they could not afford liquor at these high prices, and they left it alone. He reiterates that these facts prove that Denmark is on the right track. Merely by enforcing a very high price for hard liquors, chronic alcoholism became so rare that the cases of delirium tremens dropped off 95 per cent. He adds that prohibition might have accomplished the same, but with the plan adopted there was no opportunity for conflict with the law, and the profession is grateful that it did not have to contend with the temptation to write prescriptions for alcohol.

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*Ageing of the Rabbit Thymus. II. T. Blom and N. Aderman.—p. 301.
Proteolytic Liver Ferment. C. G. Zachrisson.—p. 333.
*Acute Meningitis in Children. A. Wallgren.—p. 341.
*White and Grey Substance in Brain. G. Dahlberg.—p. 351.
Report on Traveling Fellowship. P. Häggström.—p. 369.
*The Parathyroids and Paralysis Agitans. E. Bergman.—p. 405.

The Rabbit Thymus.—In this second report of study of the ageing process, the number and size of Hassall's bodies are considered. (In German.)

Benign Acute Meningitis in Children.—Wallgren warns that epidemic encephalitis and poliomyelitis are liable to begin with symptoms deceptively simulating tuberculous meningitis. He describes three such cases in children, and cites Nauclér's ten in adults, the recovery disproving the presumptive diagnosis of tuberculous meningitis. In Eskuchen's case of rapidly fatal epidemic encephalitis presenting this same syndrome, lumbar puncture had shown 640 cells. Nauclér classes his cases as acute serous meningitis although in one case the puncture fluid contained 2,590 cells per c.mm. In one of Wallgren's cases, epidemic meningitis had been diagnosed and serotherapy was begun, but the next day paralysis of the legs corrected the diagnosis to poliomyelitis. (In German.)

Relative Volumes of Gray and White Substance in the Brain of Man.—Dahlberg has modified the Jaeger method for research in this line, and tabulates the comparative findings in different parts of the brain and in men and in women. If his findings are confirmed by others, they indicate, he says, a highly interesting difference between the sexes, especially in the frontal lobe. (In English.)

The Parathyroids and Paralysis Agitans.—Bergman reports negative results of parathyroid treatment and transplantation in an effort to benefit paralysis agitans and the parkinsonian symptoms of epidemic encephalitis. Nothing was observed in the eight cases described that suggests any connection between the parathyroids and parkinsonism.